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# ENVIRONMENTAL ASSESSMENT BOARD

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VOLUME: 126

DATE: Thursday, August 17th, 1989

BEFORE: M.I. JEFFERY, Q.C., Chairman

E. MARTEL, Member

A. KOVEN, Member



FOR HEARING UPDATES CALL (TOLL-FREE): 1-800-387-8810

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HEARING ON THE PROPOSAL BY THE MINISTRY OF NATURAL  
RESOURCES FOR A CLASS ENVIRONMENTAL ASSESSMENT FOR  
TIMBER MANAGEMENT ON CROWN LANDS IN ONTARIO

IN THE MATTER of the Environmental  
Assessment Act, R.S.O. 1980, c.140;

- and -

IN THE MATTER of the Class Environmental  
Assessment for Timber Management on Crown  
Lands in Ontario;

- and -

IN THE MATTER OF a Notice by the  
Honourable Jim Bradley, Minister of the  
Environment, requiring the Environmental  
Assessment Board to hold a hearing with  
respect to a Class Environmental  
Assessment (No. NR-AA-30) of an  
undertaking by the Ministry of Natural  
Resources for the activity of timber  
management on Crown Lands in Ontario.

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Hearing held at the Ramada Prince Arthur  
Hotel, 17 North Cumberland St., Thunder  
Bay, Ontario, on Thursday, August 17th,  
1989, commencing at 8:00 a.m.

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VOLUME 126

BEFORE:

MR. MICHAEL I. JEFFERY, Q.C.	Chairman
MR. ELIE MARTEL	Member
MRS. ANNE KOVEN	Member



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A P P E A R A N C E S

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MS. Y. HERSCHER )	
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I N D E X   O F   P R O C E E D I N G S

<u>Witness:</u>	<u>Page No.</u>
<u>PETER KINGSBURY,</u> <u>LEONARD RITTER</u> , Resumed	21268
Continued Cross-Examination by Mr. Castrilli	21268
Cross-Examination by Mr. Hanna	21304





I N D E X   O F   E X H I B I T S

<u>Exhibit No.</u>	<u>Description</u>	<u>Page No.</u>
771	Article entitled: Early Winter Utilization by Moose of Glyphosate-Treated Cut-Overs, B. Sc. in Forestry, thesis, Lakehead University, Thunder Bay by Connor and Gratz, 1986.	21441
772	Document entitled: Memorandum of Understanding Between Office of Pesticide Programs, U.S. Environmental Protection Agency, and Environmental Health Directorate, Health and Welfare Canada, dated December 18, 1979.	21503





1       ---Upon commencing at 8:07 a.m.

2                   THE CHAIRMAN: Good morning. Be seated,  
3 please.

4                   MS. MURPHY: We have a couple of  
5 documents that were given numbers yesterday that I can  
6 provide now.

7                   The first was marked as Exhibit 764. It  
8 is a paper by Peter Kingsbury entitled: Fenitrothion  
9 Avian Impact, dated January, 1988.

10                  And the second one, which was marked as  
11 Exhibit 765, is entitled: A Review of the Environment  
12 Canada Atlantic Region Document, (Environmental Effects  
13 of Fenitrothion Use in Forestry), and that's a review  
14 document by Forestry Canada.

15                  THE CHAIRMAN: Thank you.

16                  MS. MURPHY: As was noted yesterday,  
17 there is no date on the document. I am advised it's  
18 quite recent as a matter of fact, but it isn't actually  
19 dated. (handed)

20                  THE CHAIRMAN: Thank you.

21                           PETER KINGSBURY,  
22                           LEONARD RITTER, Resumed

23                  THE CHAIRMAN: Mr. Castrilli?

24       CONTINUED CROSS-EXAMINATION BY MR. CASTRILLI:

25                  Q. Dr. Ritter, we've done night court

1       this week and now we are doing dawn patrol. Could  
2       I just ask you first about Exhibit 753 which is a  
3       letter you filed yesterday on the analysis of  
4       2,3,7,8-TCDD in 2,4-D?

5                     DR. RITTER: A. Yes.

6                     Q. Sorry, do you have it before you?

7                     A. Yes, I do.

8                     Q. I'd like to take you to the fourth  
9       paragraph on that page.

10                    MR. CASTRILLI: Sorry, Mr. Chairman, does  
11       the panel have that exhibit?

12                    THE CHAIRMAN: Probably.

13                    MR. CASTRILLI: Exhibit 753.

14                    Q. Sorry, the fourth paragraph, Dr.  
15       Ritter, the last sentence notes that a -- sorry, let me  
16       read the whole paragraph. It is a letter from Dr.  
17       Chang from Agriculture Canada to someone, and the forth  
18       paragraph reads:

19                    "I further discussed this matter with Dr.  
20       J. Singh of our Laboratory Services  
21       Division. According to Dr. Singh our  
22       analytical method is more specific than  
23       that used by Dr. Hagrenmaier. To date,  
24       our monitoring of 2,4-D products entering  
25       the Canadian market has not shown the



1 presence of 2,3,7,8-TCDD contamination.

2 A copy of Dr. Singh's memo commenting on  
3 this matter is attached for your  
4 information."

5 The memo was not attached to the letter,  
6 Dr. Ritter, and I would ask if you would make a copy of  
7 the memo available for the Board as well?

8 DR. RITTER: A. Yes, of course.

9 Q. Thank you. Next, Dr. Ritter, Exhibit  
10 766, which is a report by Bio-Research Laboratories  
11 Ltd.

12 A. Yes.

13 Q. Sorry, do you have that handy?

14 A. I do.

15 Q. The report -- what we have is  
16 actually the summary. Are we in the process of  
17 obtaining the full report?

18 A. Yes. As the Chairman had instructed  
19 me yesterday, I will make one copy of the report  
20 available through Ms. Murphy for reference by anyone  
21 who is interested in seeing it.

22 Q. And the report that we're receiving,  
23 is that the final?

24 A. Yes, it is.

25 Q. And what's the date of the final, if

1       you know?

2                   A.   It's the -- this is taken directly  
3       out of the larger report.   This is a summary page which  
4       is contained in the first page of the final report.

5                   Q.   I just note that the cover page notes  
6       that it's a draft.

7                   A.   The draft -- it will say draft.   It's  
8       draft in the sense that this is a contract laboratory  
9       and until such time that the study -- until such time  
10      as we formally accept the report, if you like, it will  
11      continue to say draft.   It's not draft in the context  
12      that Bio-Research did not file anything subsequent to  
13      this date.

14                  Q.   Okay.   And has Health and Welfare  
15      accepted the report?

16                  A.   Yes.

17                  Q.   Dr. Ritter, do you have Exhibit 752  
18      handy, that would be the article on the Effects of  
19      Paternal Subacute Exposure to Tordon 202c--

20                  A.   Yes, I do

21                  Q.   --et cetera?

22                  A.   Yes.

23                  THE CHAIRMAN:   Is it 52 or 62?

24                  MR. CASTRILLI:   Exhibit 752.

25                  Q.   Dr. Ritter, this was a report

1 prepared by several members of the Department of  
2 Veterinary Physiologic Sciences at Western College of  
3 Veterinary Medicine at the University of Saskatchewan  
4 and reported in the 19 -- well, I don't know if -- in  
5 the Journal of Teratology in 1989.

6 Are you familiar with or do you know the  
7 authors?

8 DR. RITTER: A. I believe I have met  
9 Patricia Blakley on occasion. I'm not familiar with  
10 the others.

11 Q. Are you aware of her work in the  
12 field?

13 A. Yes, generally speaking.

14 Q. The report was prompted by forestry  
15 use of herbicides generally in Saskatchewan and the  
16 findings of the report were that the 2,4-D and picloram  
17 mixture, which is known as Tordon, were found to -- or  
18 was found to create birth defects in offspring of mice  
19 following exposure of the product to male mice only.

20 Is that a fair summary of the report's  
21 contents?

22 A. Yes, it is.

23 Q. And the authors conclude that the  
24 results suggested a role for paternal exposure to  
25 Tordon in prenatal reproductive toxicity. Is that an



1       assessment you concur with?

2                   A.   Not on the basis of this report, Mr.  
3   Castrilli, no.

4                   Q.   I will just take you to page 239.

5                   A.   Yes.

6                   Q.   We're looking at the top -- sorry,  
7   we're looking at the right-hand column, the top of that  
8   page?

9                   A.   Yes.

10                  Q.   The top of that column.

11                  A.   Yes.

12                  Q.   The report notes:

13                       "The percentage of abnormal fetuses  
14                       was increased in the highest dosage  
15                       group, while the percentage of malformed  
16                       fetuses was increased in the middle  
17                       dosage group and the percentage of  
18                       fetuses with variants was increased in  
19                       the lowest and highest dosage groups.  
20                       The malformations included..."

21                       It's a little early in the morning to be  
22   pronouncing some of these words,

23                       "...ablepharon..."

24                  A.   Yes.

25                  Q.   Can you advise the Board what that

1 is?

2 A. I can't give you a precise definition  
3 of that particular anomaly, it's not one which is  
4 frequently reported.

5 Q. All right, that's fine.

6 "...cleft palate, and unilateral agenesis  
7 of the testes."

8 Can you advise the Board what that is?

9 A. Failure to develop one testicle.

10 Q. Okay. The -- sorry, we are now at  
11 page 240 under the Discussion, the first sentence  
12 thereunder:

13 "The results from the present study  
14 suggests a role for paternal exposure  
15 to Tordon 202c in prenatal toxicity."

16 Now, you noted a moment ago you don't  
17 agree with the conclusions of the authors with respect  
18 to that, and can you advise the Board as to why--

19 A. Yes.

20 Q. --that's the case?

21 A. There are three reasons really why,  
22 Mr. Castrilli, that I would have difficulty drawing  
23 significant conclusions from this work.

24 Firstly, because it follows a very, very  
25 unconventional protocol and, as you may or may not be

1       aware, as the Board may be aware, teratology testing by  
2       convention follows the protocol which is fundamentally  
3       quite different from this one, and it would be -- it's  
4       difficult to interpret a singular study in the context  
5       of studies that are usually done quite differently.

6               Secondly, it's done in mice and that's a  
7       very unusual species in which to do teratology studies  
8       because they're very small and fetal tissue in a mouse  
9       is smaller yet.

10              I don't know if I can put this into  
11       perspective for you. A rat fetus - and a rat, of  
12       course, you will know the difference in size between a  
13       rat and a mouse laboratory - a rat fetus might be one  
14       inch on delivery, a mouse fetus might be a fifth of  
15       that. So that it becomes very difficult to do  
16       extensive precise examinations on fetal tissue which is  
17       that small.

18              That's why the rabbit, as a non-rodent  
19       species, is often favoured because the fetal tissue is  
20       quite larger.

21              Thirdly, and perhaps most significantly,  
22       I spent some time in the last seven or eight days from  
23       time to time talking about the importance of the  
24       phenomenon of biologic -- of dose response in a  
25       biological phenomenon. And the authors themselves, Mr.



1       Castrilli, actually note that this study has not  
2       achieved that very, very basic principle. I would  
3       refer you to page 240 specifically. Their first  
4       complete sentence in the right-hand column:

5                        "Admittedly, it must also be recognized  
6                        that these effects on fetal development  
7                        were not dose dependent."

8                        I find it noteworthy that the authors  
9       themselves draw one's attention to that. To me it  
10      indicates that they recognize the importance of that  
11      feature. And if we go specifically to the abstract  
12      where the results really of the paper are summarized,  
13      I'm just going to give you a couple of examples of  
14      where that's occurred.

15                      Q. Sorry, Dr. Ritter, before you go to  
16      page 240, I just didn't have the place where you quoted  
17      that sentence.

18                      A. Right-hand column, first complete  
19      sentence:

20                      "Admittedly, it must also be recognized  
21                      that these effects on fetal development  
22                      were not dose dependent."

23                      I find that sentence to be very honest  
24      and very candid and I take it to -- to me it suggests  
25      that the authors recognize the fundamental importance

1 really of the dose response phenomenon because they  
2 point out quite clearly that these parameters have not  
3 achieved it and they are quite correct.

4 Q. Dr. Ritter, just continuing with the  
5 remainder of that paragraph, though, the authors go on  
6 to state:

7 "However, these effects were not isolated  
8 in single litters but were apparent among  
9 the litters in the various treatment  
10 groups."

11 A. That's correct.

12 Q. Doesn't that suggest to you that the  
13 authors were nonetheless concerned about the effects  
14 they are seeing?

15 A. Oh, absolutely, they've published the  
16 paper. Really what I'm trying to explain to you, Mr.  
17 Castrilli, is you ask why I have some reservations  
18 about the conclusions, and I'm trying to give those to  
19 you.

20 The observation that they made stands.  
21 I'm trying to not argue with whether or not they've  
22 made the observation, but really attach some weight to  
23 it for you; how much importance should one attach to  
24 observations made in this kind of a context.

25 And if we go to the abstract, for

1       example, and I'm reading now from the middle of the  
2       paragraph:

3                       "The incidence of malformed fetuses..."

4                       Which is of course perhaps the most  
5       significant observation in a teratology study because,  
6       after all, a teratology study is designed to look for  
7       malformations:

8                       "...was increased in the middle dose  
9                       group..." only.

10                      Only isn't there, I'm adding that, but it  
11       was restricted to the middle dose group.

12                      Now, you have to ask yourself:  
13       Biologically what could be driving an effect which  
14       would not occur in the low dose group occur in the  
15       middle, but then as the dose increases disappear.

16                      That kind of thing, as you go through the  
17       manuscript, I think you will find appears on a number  
18       of occasions, it's not necessarily restricted to the  
19       malformed fetuses.

20                      So in summary really to answer your  
21       question, I think it's a -- in terms of an experiment  
22       which the authors wanted to communicate to the  
23       scientific community, I think it is noteworthy. I  
24       would just note, as I say, these three observations for  
25       you. The study has not satisfied some very fundamental

1 biological criteria, it does not follow a conventional  
2 protocol, and it's not done in a conventional species.

3 Q. Sorry, the conventional species would  
4 normally be the rat, in your view?

5 A. Yes. That's not to say it's never  
6 done in mice, but it's not frequently done in mice.  
7 The favoured species is the rat.

8 But if I had to rank those concerns, I  
9 can't emphasize too strongly that the failure to  
10 achieve a dose response relationship for the most  
11 important of the parameters evaluated in this kind of a  
12 study I would say significantly detracts from its  
13 overall biological weight.

14 Q. So, in your view, this study does not  
15 raise concerns for worker or bystander exposure to this  
16 herbicide?

17 A. I don't think this study contributes  
18 in a significant way to our understanding of the  
19 teratogenic potential of the compound. One would need,  
20 at the very least, to first evaluate the efficiency of  
21 the protocol.

22 I spent some time yesterday, as you may  
23 recall, discussing the difference between a regimented  
24 registration requirement and biological value within a  
25 study. And this study, of course, would not satisfy a



1 registration requirement. Quite frankly, that makes no  
2 difference at all. If it's a useful biological study,  
3 then it would be useful.

4 But before we can actually determine if  
5 it's a useful biological study we'd have to ask  
6 ourselves imperically if the study is capable, from the  
7 intrinsic features of its protocol, of answering the  
8 questions that you are asking of it.

9 And because the protocol is so very  
10 unconventional, as you may know -- I keep saying it's  
11 unconventional. I should perhaps, just for the purpose  
12 of reference, indicate that in a conventional  
13 teratology study the females would be exposed to the  
14 suspect agent during the critical period of gestation  
15 for that particular specie.

16 This protocol is very different, as you  
17 will note, because the females are not exposed at all.  
18 That's not to say that exposing the males is a bad  
19 idea. What I'm trying to say is that until one could  
20 really evaluate the utility of this kind of a protocol,  
21 it's difficult to attach importance to a study  
22 generated from such a protocol.

23 Q. But, Dr. Ritter, wasn't that  
24 precisely the point of the study, the fact that females  
25 were not exposed only males were exposed and yet we saw

1 the incidence of malformed fetuses, although not  
2 statistically significant, in the offspring in the  
3 females. Isn't that precisely the purpose of the  
4 study?

5 A. No, let me put it to you another way,  
6 Mr. Castrilli. I'm not arguing with the purpose of the  
7 study, I'm arguing with the ability of the study to  
8 test that purpose.

9 If I were looking at this kind of a  
10 protocol, for example, my temptation would be first to  
11 take a series of positive controls, chemicals for which  
12 I can very accurately predict the outcome, and test  
13 them by a series of protocols, including this one, so  
14 that I can then evaluate the efficiency of the protocol  
15 to establish a principle that I already know.

16 And one might use agents such as aspirin,  
17 for example, which is teratogenic in a variety of  
18 animal species, and so on and so forth. There are  
19 other agents that one uses as positive controls.

20 Once you're convinced that the protocol  
21 is capable of answering the question you're asking,  
22 then you can evaluate the effect of the chemical in the  
23 protocol.

24 So I'm not arguing with the intent of the  
25 study, Mr. Castrilli, I'm arguing - I'm not even

1       arguing - I am asking as to whether or not the study is  
2       actually capable of answering the question.

3                   MR. MARTEL: Can I ask a question though?  
4       If you see the results of this type of study, what does  
5       that do to you? I mean, what does it suggest, that you  
6       either do further work or that you -- you just don't  
7       ignore those findings; do you?

8                   DR. RITTER: No. If this kind of study  
9       appears, as it has, and the cover date is 1989 -- I  
10      have not seen this previously, but it may have appeared  
11      only very recently.

12                   There is, for example, among other  
13      things, National Health Development Research Program  
14      which is designed to fund interesting research in this  
15      kind of area. Now, if these authors, for example, were  
16      to apply for funding to develop work on such a  
17      protocol, then certainly we would be supportive of  
18      applications of that type.

19                   If they were to apply to the Medical  
20      Research Council for funding and we were asked to  
21      referee such applications, we would certainly  
22      indicate -- I'm talking now in the general case, not  
23      really specifically in this case. If we felt that that  
24      kind of a protocol showed promise for the evaluation of  
25      potential effects, then we would certainly support

1       those kinds of funding programs. We would encourage  
2       funding agencies to consider very seriously funding  
3       those kinds of programs.

4               But I can't emphasize to you strongly  
5       that in the context of this study in particular there  
6       are two very important features here. No. 1, it has  
7       not satisfied the phenomenon of biological dose  
8       response, and of all the phenomenon that we deal with  
9       in biology that is by far and away the most important.

10              It doesn't make a difference if we're  
11       dealing with the bio-medical sciences or the strict  
12       biological sciences or environmental effects or what  
13       have you, it's difficult, in a biological context, to  
14       imagine how an increase in dose results in a decrease  
15       in effect. And that's what these authors have reported  
16       for what is perhaps the most important of all effects  
17       for which they look in this kind of a study. And the  
18       protocol design itself, as I mentioned, until you're  
19       confident that the protocol is reliable, it would be  
20       difficult to attach a sense of importance to the work.

21              It's a developmental stage type of  
22       exercise, let me put it that way. It looks  
23       interesting, it is a novel approach to examining an  
24       older principle, it may be very useful. It's got some  
25       way to go before it would be reliable or predictive



1 based on the results that have been presented.

2 MR. CASTRILLI: Q. Dr. Ritter, can I ask  
3 you to refer to Exhibit 718, it is the WHO report on  
4 2,4-D?

5 DR. RITTER: A. Yes.

6 Q. Actually it's excerpts from that  
7 report. This is listed as -- I'm sorry.

8 MR. CASTRILLI: Mr. Chairman, I think you  
9 have it. (indicating)

10 Q. Dr. Ritter, this was published in  
11 1984 and it's listed as Environmental Health Criteria  
12 Report No. 29. Do you know how many there would be now  
13 in the series, if you know?

14 DR. RITTER: A. I think there are about  
15 60.

16 Q. 60. Would you know how many deal  
17 with pesticides?

18 A. A fair number. I can't give you a  
19 number, but not a trivial number.

20 Q. So that would -- just looking at the  
21 first page -- sorry, the second cover page--

22 A. Yes.

23 Q. --where the first 28 were listed.  
24 Can you confirm for me that in the first 28 studies the  
25 only pesticide was DDT?

1                   A. Not necessarily. Mercury has had  
2                   pesticidal applications, as you may know.

3                   Q. In history, not -- surely not today?

4                   A. Are you asking if there are criteria  
5                   documents on pesticides in use today?

6                   Q. Sorry. Just looking at this page,  
7                   this report -- I don't know when that was written.

8                   A. In 1984.

9                   Q. No, I mean the reference to mercury.

10                  A. Oh, I don't know. But WHO does not  
11                  have an interest in developing these criteria documents  
12                  for pesticides that are brand new; that's not the  
13                  intent of the program.

14                  These documents are prepared under the  
15                  auspices of the International Program on Chemical  
16                  Safety and they're directed primarily, but not  
17                  exclusively, at developing countries where often the  
18                  information contained in these documents may be the  
19                  only source information available on the chemical.

20                  Now, if the chemical is brand new, if  
21                  it's just been introduced into the marketplace,  
22                  particularly in contemporary times, there is a wealth  
23                  of information available. So that this document, this  
24                  kind of a document would serve very little practical  
25                  purpose.

1                   Where they are useful is where a chemical  
2                   may have been in use for some years, in fact perhaps  
3                   predating by some time the introduction of the more  
4                   current guidelines and, consequently, these documents  
5                   would then represent an assimilation of all of the  
6                   information as compared to current registration data.

7                   So I don't think you'll find these kinds  
8                   of documents on any current pesticides, they will all  
9                   be on pesticides that have more of a historical  
10                  perspective to them.

11                  Q.   Multi-decade in terms of use?

12                  A.   Yes.

13                  Q.   Okay.  Mercury would have had use in  
14                  Canada in probably no later than the 60s, maybe the  
15                  early 70s?

16                  A.   I think you're probably right.  I  
17                  don't know exactly, but it's certainly some years.  
18                  There are others here though that have had pesticidal  
19                  use, arsenic has had pesticidal use.

20                  Q.   This is all historic in terms of  
21                  Canada; is that right?

22                  A.   This is all...?

23                  Q.   Historic in terms of Canada.  That  
24                  would not be the case today?

25                  A.   I think arsenic is still registered

1 for use in Canada as a pesticide.

2 Q. As a pesticide?

3 A. Yes.

4 Q. I'm surprised to hear that, but I  
5 will accept your indication.

6 A. There are others. There are a number  
7 here on the page that have had pesticidal application.

8 Q. Okay. Actually, Dr. Ritter, it's  
9 distressing to hear that arsenic is actually part of a  
10 pesticide, but I will leave it at that. Exhibit 760,  
11 it's the Dow Chemical case.

12 THE CHAIRMAN: Sorry, what did you say?

13 MR. CASTRILLI: It's the Dow Chemical  
14 case, the appeal.

15 DR. RITTER: Yes.

16 MR. CASTRILLI: Q. Sorry. We are  
17 looking at page -- let's begin with page 27 and 29. It  
18 is Footnote 1.

19 DR. RITTER: A. Yes.

20 Q. There is a reference to the American  
21 Board of Toxicology. Can you just generally, if you  
22 know, advise the Board what that is?

23 A. Yes. The American Board of  
24 Toxicology is a -- it's an association which offers to  
25 certify its members through examination at a level of



1 competence, at a specified level of competence.

2 Membership or certification by the  
3 American Board of Toxicology is not required, it is  
4 voluntary, and I know of no organization that actually  
5 requires that its staff toxicologist be certified by  
6 the American -- it's not a licensing body, it's an  
7 association.

8 Q. Is there a test or a series of exams  
9 required in order to obtain the certification?

10 A. Yes, there are.

11 Q. Are you a member of the American  
12 Board of Toxicology?

13 A. No, I'm not.

14 Q. And you are not a medical doctor; is  
15 that correct?

16 A. That's correct.

17 Q. Dr. Ritter, I just wanted to refer  
18 you to your testimony of August 8th. I'm just going to  
19 paraphrase it.

20 MS. MURPHY: Just hold on.

21 MR. CASTRILLI: Do you have a copy?

22 MS. MURPHY: I believe so.

23 MR. CASTRILLI: It's Volume 120.

24 MS. MURPHY: (handed)

25 DR. RITTER: Yes.

1 MR. CASTRILLI: Q. Sorry. We are  
2 looking at page - I'm amazed - 20155. Actually that's  
3 the second most distressing thing I've seen this  
4 morning.

5 THE CHAIRMAN: It will get worse.

6 DR. RITTER: Yes.

7 MR. CASTRILLI: Q. Sorry. We are  
8 looking at what would be the second full paragraph?

9 DR. RITTER: A. Yes.

10 Q. And, in particular, the last sentence  
11 in that paragraph, and then going on to line four of  
12 page 20156.

13 You stated, I believe, in response to a  
14 question from the Chairman as follows:

15 "I tend to look at the IBT situation  
16 really as one of our finest hours rather  
17 than as a weakness in the system."

18 And then going on down the page, you view  
19 that as such because the regulatory agencies both in  
20 Canada and the United States recognize that these  
21 improper practices -- improper and fraudulent practices  
22 were going on really within a relatively short period  
23 of time when they started.

24 And you say on the top of page 20156,  
25 that to the credit of both our system--

1 I presume you mean the Canadian system?

2 A. Yes.

3 Q. --and to the Americans, that the  
4 fraud became evidence very soon after it had been  
5 initiated. When, if you know, were fraudulent studies  
6 first undertaken by IBT?

7 A. The dates on studies which gave rise  
8 to the disclosure were of the order of the latter 70s,  
9 '76, '77, '79, '78, somewhere in that...

10 Q. All right. Sorry, so the earliest  
11 would be about 1976; is that right?

12 A. That's about the period of time.

13 Q. So that would be roughly when the  
14 study was submitted?

15 A. That's correct.

16 Q. And in that period '76 to '79, I  
17 guess by '79 certainly the agencies knew about the  
18 problem?

19 A. I think that's correct, yes.

20 Q. The exhibit I filed yesterday,  
21 Exhibit 769, talked about over 2,000 studies. IBT  
22 would have undertaken up to 2,000 fraudulent studies  
23 between the period '76 and '79?

24 A. Mr. Castrilli, many, many of the  
25 studies that a contract laboratory such as IBT would be

1       doing would be acute studies. These are one-shot  
2       single exposure, so that in a large facility like IBT  
3       or like Bio Research Laboratories that did the study  
4       for us, one might run five -- one could run 500 acute  
5       studies in a week.

6               So that that number is not nearly as  
7       impressive as it first sounds until one has a sense of  
8       the kind of study that was being run.

9               Q. Right. As you may know, or can  
10      confirm for me, ultimately Canada and the U.S. didn't  
11      end up re-evaluating all 2,000 of the studies; isn't  
12      that right, they decided as a matter of policy not to  
13      re-evaluate many of the acutes.

14              A. That's correct.

15              Q. Because they were not regarded as  
16      pivotal; is that correct?

17              A. Well, not -- that they were not  
18      regarded pivotal was in part the reason, but also  
19      because it was concluded that it would take more effort  
20      to establish the validity of an acute study - more  
21      effort and, I might add, more cost in terms of that  
22      effort - to establish the validity of an acute study  
23      than simply to repeat it.

24              Q. So that a determination of what was a  
25      pivotal study really centered on what we have terming



1 over the last several days the long-term and the  
2 special tests; namely the chronic?

3 A. I think that is more or less correct,  
4 but you are asking me now to recall a definition that  
5 is almost ten years old.

6 Q. Well, would you accept subject to  
7 verification that, in fact, the decision was made to  
8 simply focus on the pivotal to and that the pivotal  
9 included many of the study types that you list in your  
10 Exhibit 709 under long-term and special tests?

11 A. Yes, I would agree with that.

12 Q. All right. And would you accept  
13 subject to verification that the number of pivotal  
14 studies, as just defined, was approximately 1,205?

15 MS. MURPHY: Well, subject to  
16 verification by whom?

17 MR. CASTRILLI: Yes, subject to  
18 verification.

19 MS. MURPHY: By whom, that's all. By  
20 whom?

21 MR. CASTRILLI: Dr. Ritter, can make the  
22 investigation or I can.

23 MS. MURPHY: Now, you are asking the  
24 question. Are you going to verify that number? That  
25 is my question.

1                   MR. CASTRILLI: Whatever is necessary to  
2     verify the number. I think Dr. Ritter is in a position  
3     to do it, I can certainly attempt to provide what it is  
4     I'm relying on. But I'm simply asking him for the  
5     purposes of this question and this morning to accept  
6     subject to verification if it was approximately 1,200  
7     studies.

8                   DR. RITTER: Is the number going to make  
9     a big difference in your question, Mr. Castrilli? I  
10    don't want to argue about the number if it's not really  
11    important.

12                  MR. CASTRILLI: Q. No, neither do I, but  
13    all I'm suggesting is that it was still a substantial  
14    number--

15                  DR. RITTER: A. Yes.

16                  Q. --that had to be re-evaluated or  
17    examined and also there was a substantial number that  
18    in fact were produced by IBT and the problem I'm having  
19    with that is that, if these were long-terms studies -  
20    as all of them would have been or many of them would  
21    have been--

22                  A. Yes.

23                  Q. --whether 1976 is in fact when the  
24    fraud was initiated or whether it was a period much  
25    earlier than 1976 in light of the time it takes to

1 actually do the long-term studies?

2 A. Well, Mr. Castrilli, that was at the  
3 crux of the problem, it didn't take them long to do a  
4 long-term study. That was the whole problem. In fact  
5 IBT did many long-term studies in a remarkably short  
6 period of time.

7 So it actually didn't take them nearly as  
8 long as you think it did, and that is one of the things  
9 in fact that became evident to us. It became apparent  
10 in a number of audits and examinations during that  
11 period that it could not humanly have been possible to  
12 have conducted, within that laboratory, some of the  
13 studies that reports to different companies suggested  
14 they had conducted.

15 So it was your very observation that led  
16 us and others to believe that there was something that  
17 wasn't quite right.

18 THE CHAIRMAN: So in fact the number of  
19 studies may not have been 2,000 that they did?

20 DR. RITTER: There was very good evidence  
21 to suggest that a significant proportion of the longer  
22 term studies, not just cancer studies but the studies  
23 that took a long time to do, some had probably never  
24 been initiated.

25 In some cases, there was no evidence that

1 the test animals or that the test material had ever  
2 been received by the laboratory and, in that case, it  
3 makes turning out 1,200 studies in a short period of  
4 time very easy.

5 MR. CASTRILLI: Q. Why did it take  
6 Canada and the United States five years to re-examine  
7 non-existent studies?

8 DR. RITTER: A. The rules that were set  
9 up at the time that these studies started coming in,  
10 when it was decided that there would be the audit  
11 program of the IBT laboratory, was that each study that  
12 had been submitted by IBT or each study that had been  
13 conducted by IBT, with the exception of the acute  
14 studies that we have discussed, would be subjected to  
15 an audit and validation program, the contents of which  
16 had been established by agreement between the United  
17 States and Canada.

18 It required -- the audit process was  
19 rather lengthy and it required verification of a  
20 substantial list of records to determine whether or not  
21 it was likely that the study, firstly, had taken place  
22 and whether or not the raw data - and when I say raw  
23 data, I don't mean the data necessarily submitted, but  
24 right back to the technician's laboratory notebook -  
25 could support the observations in the final report and



1 the conclusions in the final report.

2 Because that audit and validation program  
3 involved that very detailed examination of records, it  
4 consumed a great deal of time. I mean, it's easy  
5 enough for me to say today, ten years later, that many  
6 of the studies probably weren't performed and I say it  
7 because I believe it's true.

8 But you will understand that at the time  
9 when this was before a U.S. grand jury, one couldn't  
10 simply say: I don't believe this study was performed,  
11 re-do it, one needed a little more than that to go on.

12 THE CHAIRMAN: What kind of evidence, if  
13 you know, was given at -- there was a criminal trial;  
14 wasn't there?

15 DR. RITTER: Yes, there was.

16 THE CHAIRMAN: And there was a conviction  
17 as well?

18 DR. RITTER: Yes, there was.

19 THE CHAIRMAN: Was there any admission  
20 of -- was it a guilty plea; do you know, on the part of  
21 the officers?

22 DR. RITTER: I don't know. I don't know.

23 THE CHAIRMAN: And you don't know what  
24 evidence was put before that court in terms of  
25 establishing which studies were or were not done. I

1 take it there would have had to have been evidence of  
2 that kind to support the conviction; wasn't there?

3 DR. RITTER: I'm sure you are correct,  
4 but I...

5 MR. CASTRILLI: If I can assist, the  
6 charges were mail and wire fraud and they focused on  
7 not more than four products to establish that. So in  
8 many ways it was a very focused trial.

9 THE CHAIRMAN: Okay. I see.

10 MR. CASTRILLI: Q. Now, Dr. Ritter, you  
11 described it as Canada's and the Americans' finest  
12 hour. The U.S. Congressional Committee investigating  
13 the matter in 1974 said that the situation, or the  
14 circumstances surrounding IBT did not inspire  
15 confidence in U.S. EPA's performance during that  
16 period, and I guess the period we are really speaking  
17 of is 1976 to 1983.

18 Is that an assessment that could also be  
19 attributed to Canada?

20 DR. RITTER: A. I have no comment on  
21 that. I don't know if the IBT situation did or did not  
22 inspire confidence in the Canadian system.

23 Q. That is fine.

24 MR. CASTRILLI: Mr. Chairman, if I could  
25 have one moment's indulgence, I may be finished. Mr.

1 Chairman, let me just take care of one housekeeping  
2 matter in the meantime.

3 I now have copies of the -- sorry, this  
4 would be Exhibit 763. These are the excerpts from the  
5 Newsletter of the Forest Pest Management Institute, the  
6 top part of the page has actually been cut off but it's  
7 Volume 8, No. 1, Spring 1989. (handed)

8 THE CHAIRMAN: Thank you.

9 MR. CASTRILLI: Mr. Chairman, those are  
10 my questions.

11 THE CHAIRMAN: Thank you, Mr. Castrilli.

12 MR. CASTRILLI: Five minutes to spare.

13 THE CHAIRMAN: Mr. Hanna, are you ready  
14 to proceed?

15 MR. HANNA: Yes, I believe we are, Mr.  
16 Chairman. Maybe we could just take five minutes to get  
17 set up -- or three or four minutes to get set up.

18 THE CHAIRMAN: The Board is going to take  
19 a break for five minutes while you have an opportunity  
20 to set up.

21 Thank you.

22 ---Recess taken at 8:55 a.m.

23 ---On resuming at 9:10 a.m.

24 THE CHAIRMAN: Thank you. Be seated.

25 Good morning, Mr. Hanna. Just before you

1 start, the Board is at your disposal until 3:00 p.m.  
2 today, that is the time we will have to rise, and we  
3 are prepared to have an abbreviated lunch hour to give  
4 you as much time as possible.

5 During the past three or four days we  
6 have had fairly intensive testimony from this  
7 particular panel in terms of both direct examination  
8 and cross-examination by Forests for Tomorrow.

9 I realize that you and Dr. Quinney have  
10 not been here for the last two or three days and it may  
11 be that you have not had an opportunity to also review  
12 the transcripts, but the Board would like, if possible,  
13 an outline of what the gist of your cross-examination  
14 will entail, and we are going to try and avoid, where  
15 possible, repetition of what has already been covered  
16 by one of the major parties.

17 One of the advantages supposedly for some  
18 of the parties following Forests for Tomorrow in terms  
19 of their cross-examination and their order of  
20 presentation, because they are a full-time party and  
21 have been here in virtual attendance on a daily basis,  
22 is to provide those other parties with some basis to  
23 follow upon the cross-examination of Forests for  
24 Tomorrow.

25 In other words, there is an advantage, in



1       our view, to having a party with their particular  
2       mandate going first, so that some of the other parties  
3       may have, in fact, some of their own concerns answered  
4       by virtue of their cross-examination. And it's  
5       unfortunate - and I understand probably some of the  
6       reasons why, that you have not been in attendance  
7       during the cross-examination of Mr. Castrilli - because  
8       we have covered a number of matters dealing with the  
9       issues to which Dr. Ritter and Mr. Kingsbury are  
10      testifying.

11                So having said that, we will certainly  
12      give you whatever latitude may be necessary but, again,  
13      we do not want a repetition of everything that has gone  
14      before through Mr. Castrilli's cross-examination.

15                So could you advise the Board what the  
16      parameters of your cross-examination will entail. We  
17      found it very helpful when you did that with the other  
18      panels.

19                MR. HANNA: Thank you, Mr. Chairman. You  
20      are perfectly right that we all do not want to be  
21      redundant, so I can assure I will look to your  
22      direction. Whenever i'm treading on ground that has  
23      already been covered, I will do my very best to get out  
24      of that as quickly as possible.

25                I did have an opportunity to speak to Mr.

1       Castrilli about his cross-examination and spoke to him  
2       very specifically about the items that I was going to  
3       deal with with my cross-examination. While I  
4       appreciate the Board's position in terms of certain  
5       parties having a lead role and whatever, I think the  
6       interests of my client and the Forests for Tomorrow  
7       have certain very different focus and I think that was  
8       confirmed in my discussions with Mr. Castrilli, in that  
9       the substance of my cross-examination, at least  
10      discussing with him, did not seem to overlap in any  
11      significant way with what he had covered. So I hope  
12      that is what will transpire.

13               To give the Board an appreciation of  
14      where I'm going, my cross-examination will be focusing  
15      on the testimony of Mr. Kingsbury and, to put it in a  
16      nutshell, I will be dealing primarily with, if you  
17      will, one very specific issue, as well a very important  
18      issue and as well a very complicated issue, but one  
19      very specific issue that Mr. Kingsbury has touched on  
20      in his evidence and I will be elaborating, of course,  
21      through my cross-examination, but that is the effects  
22      of herbicides on terrestrial wildlife populations.

23               I have no intention - and I say this to  
24      the panel so that they appreciate it also - I have no  
25      intention of moving into the area of toxicology, toxic

1 effects of various chemicals and whatever. I believe  
2 Mr. Castrilli has gone into that in great depth and I  
3 do not believe that there is any need to deal with that  
4 any further, and I will not be touching on that subject  
5 in any way whatsoever that I anticipate at this time  
6 and I am not anticipating in the future.

7 So that the thrust of what I will be  
8 trying to discuss with Mr. Kingsbury deals with this  
9 matter of how herbicides impact particularly through  
10 the habitat of wildlife and terrestrial wildlife and  
11 what the consequence of that are and how that should be  
12 dealt with in the timber management planning process  
13 before the Board.

14 So if that helps, Mr. Chairman, that is  
15 where I'm going.

16 THE CHAIRMAN: Yes, it does. Thank you  
17 very much.

18 MR. HANNA: Mr. Chairman, I had tried to  
19 be as organized as possible and tried to get a list of  
20 exhibits and circulate to all the parties.  
21 Unfortunately, the photocopier, we couldn't him to do  
22 it, but I have circulated the list of exhibits to the  
23 other parties. I don't think it's necessary to read it  
24 into the record, I think the other parties have it, and  
25 I believe I have given copies to Mr. Mander, so

1        hopefully the Board has that.

2                    MS. MURPHY: I would like to point out  
3        that we received this list this morning and one of the  
4        items on the list is Exhibit 310, the Timber Management  
5        Guidelines for the Provision of Moose Habitat. As I  
6        pointed out, we received the list this morning. I have  
7        no idea whether either of these witnesses, in  
8        particular Mr. Kingsbury, has ever read that document.

9                    THE CHAIRMAN: Mr. Kingsbury, have you  
10       read the moose habitat guidelines?

11                   MR. KINGSBURY: Mr. Chairman, I'm not  
12       aware that I have in fact seen those, although I may  
13       have seen a draft. When were those guidelines  
14       produced? Is there a date on?

15                   MR. HANNA: They were originally produced  
16       I think about 1976 but the formal version I believe is  
17       1986.

18                   MS. MURPHY: February, 1988, Mr.  
19       Chairman. I have a copy, I certainly can provide that  
20       to the witness. I just wanted to advise that I was  
21       unaware but I was fairly certain that he had probably  
22       never read it.

23                   THE CHAIRMAN: Well, Mr. Kingsbury is a  
24       fairly experienced witness, he may well be able to deal  
25       with the questions, Ms. Murphy, notwithstanding that he



1       hasn't read the document in full.

2                       However, Mr. Kingsbury, if one of the  
3       questions or any of the questions that are put to you  
4       are such that, in your view, your ability to answer  
5       those questions is impaired because of the fact that  
6       you haven't had an opportunity to read that document or  
7       read the portions of the document that is applicable,  
8       then we will take that into account and deal with it at  
9       the time.

10                      MR. KINGSBURY:   Okay.   I would indicate,  
11       Mr. Chairman, I have never seen the final version and  
12       if I saw the draft my knowledge of it certainly is very  
13        cursory.

14                      THE CHAIRMAN:   But the principles and the  
15       actual items dealt with in that may be familiar to you,  
16       notwithstanding you haven't seen the document itself.

17                      MR. KINGSBURY:   Yes.

18                      MR. HANNA:    I think we can deal with it  
19       as we go, Mr. Chairman.   I'm not in any way attempting  
20       to go back through the moose habitat guidelines.   We  
21       went through that one before, we don't need to go back.

22                      THE CHAIRMAN:   Okay.

23       CROSS-EXAMINATION BY MR. HANNA:

24                      Q.   Good morning, Mr. Kingsbury.

25                      MR. KINGSBURY:   A.   Good morning, Mr.

1 Hanna.

2 Q. I note in your witness statement that  
3 those paragraphs that you are speaking to fall under the  
4 heading of effects of pesticides on habitat; is that  
5 correct?

6 A. Yes, I believe that's correct.

7 Q. Can you explain to me what is meant  
8 by habitat in this context?

9 A. In my direct evidence I, as you can  
10 appreciate, talked in very general terms. The general  
11 terms I was speaking to were partly addressing the fact  
12 that I was trying to cover pesticide effects on a very  
13 wide range of organisms.

14 Most pesticide impact studies have  
15 focused on species that are fairly easy to work with,  
16 species that are -- ones that are considered, for  
17 whatever reasons, to be most sensitive to the  
18 pesticide. Certainly in terms of insecticide work,  
19 that means sensitivity in terms of toxilological  
20 sensitivity.

21 And so in my direct evidence I believe I  
22 was speaking in habitat trying to encompass the fact  
23 that habitat is important to all organisms, that  
24 habitat as impacted by pesticide can encumber the  
25 values for food, shelter, reproductive sites, nesting

1 sites, not limited to but including those parameters.

2 Q. So it would be fair to say that your  
3 evidence, if you will, covers the full gamut that you  
4 might put into that term habitat and deals with both  
5 terrestrial and aquatic systems?

6 A. That's correct, but it was a very,  
7 very general level.

8 Q. I'm not trying to get a rigorous  
9 scientific definition at this time, I'm just trying to  
10 get an appreciation.

11 A. Okay.

12 Q. In paragraph 45 of your witness  
13 statement it indicates those paragraphs to which you  
14 will be speaking and it indicates there that you will  
15 be speaking to paragraphs 33 to 40?

16 A. Okay. Excuse me, Mr. Hanna. When  
17 you say paragraph 45 of the witness statement you are  
18 dealing with...?

19 Q. I'm dealing with Volume I, the  
20 Statement of Evidence for Panel 13.

21 THE CHAIRMAN: 604A.

22 MR. HANNA: Thank you, Mr. Chairman.

23 MR. KINGSBURY: Okay. And the page  
24 number, please?

25 MR. HANNA: Q. It's page 77.

1 MR. KINGSBURY: A. Okay, I am sorry, I  
2 just -- we've had so much paper--

3 Q. We all have the same problem.

4 A. --referred to in different ways. I  
5 think I'm with you now.

6 Q. All right. You see that it indicates  
7 there that you will be speaking to paragraphs 33 to 40.

8 A. Okay.

9 Q. That's correct?

10 A. That's correct.

11 Q. Now, under that heading there's a  
12 paragraph that seems no one is speaking to and that is  
13 paragraph 32. Was that just an oversight, you are also  
14 speaking to paragraph 32? As you see that none of the  
15 witnesses are speaking to paragraph 32.

16 A. Okay. If I can just read it for a  
17 second.

18 Q. Yes.

19 A. I think that is appropriate,  
20 certainly.

21 Q. If you keep your witness statement in  
22 front of you I'm just going to go through it with you.

23 A. Okay.

24 Q. Can we look at paragraph 33. That  
25 paragraph lays out three possible concerns with the use



1 of pesticides; is that correct?

2 A. That's correct.

3 Q. Now, would you not agree with me, at  
4 least from a wildlife perspective, that the vast  
5 majority of research on pesticides has been on the  
6 first concern; that is, the toxilological, the direct  
7 effects on non-target organisms?

8 A. Oh yes, very much so.

9 Q. The second concern involves the  
10 influence of pesticides on the habitat of certain  
11 species. And would you say that this includes the  
12 influence of herbicides on the habitat of large  
13 ungulates such as moose?

14 A. Certainly.

15 Q. Now, I'm going to ask you a series of  
16 questions here really to get them out of the way so we  
17 can go to what is the real focus of my evidence (sic),  
18 and I'm going to repeat them, the words will change  
19 slightly, so I'm just going to go through and ask for  
20 your opinion on each one of the questions. So if you  
21 listen very carefull, I'm going to ask you if you agree  
22 or disagree.

23 A. Okay.

24 Q. Is it your view that the approved  
25 insecticides for use in forestry in Ontario pose no

1       significant threat to terrestrial wildlife as a result  
2       of direct toxic effects?

3                   A. I believe that you will find that  
4       that's stated in some detail in my direct evidence,  
5       yes.

6                   Q. Would you say that your opinion has a  
7       high degree of certainty or a low degree of certainty?

8                   A. I guess I would be more comfortable  
9       saying, within my direct evidence I went through  
10      different groups of organisms, spelled out the degree  
11      of potential impact and the actual impact that we would  
12      associate with different insecticides on different  
13      groups.

14                   Certainly we know more about some groups  
15      than other groups but, I feel in general that we -- for  
16      the materials that we are -- the insecticides, and I  
17      believe you are focussing on insecticides, that we are  
18      talking about in this exercise, we have a very  
19      considerable database on their impacts on a range of  
20      organisms.

21                   Q. Is it your opinion that insecticides  
22      approved for use in forestry in Ontario pose no  
23      significant threat to terrestrial wildlife in terms of  
24      impacts on their habitat?

25                   A. I would -- within -- yes, and perhaps

1       this seems ridiculous, but some wildlife species might  
2       benefit by the actions of the pest species; i.e., as  
3       the pest itself changes habitat, that may become better  
4       habitat for some wildlife species. All right.  
5       Obviously the effect of the pest can be to change  
6       succession or the rate of succession within the forest.

7                   I would say, in general, that the use of  
8       insecticides tends to preserve habitat qualities for  
9       the species that require the types of habitat that the  
10      forest that is being attacked by the pest provides.  
11      And, from that context, it tends to be a maintaining  
12      habitat.

13                   Q.   Would you say your opinion has a high  
14      or low degree of certainty with respect to this matter?

15                   A.   A high degree.

16                   Q.   Is it your view that herbicides  
17      approved for use in Ontario pose no significant threat  
18      of direct toxic effects to terrestrial wildlife?

19                   A.   That is my evidence, yes.

20                   Q.   Would you say your opinion has a high  
21      or low degree of certainty?

22                   A.   A high degree.

23                   Q.   A high degree of certainty?

24                   A.   Yes, a high degree of certainty.

25                   Q.   Is it your opinion that herbicides

1 approved for use for forestry in Ontario pose no  
2 significant threat to the habitat of terrestrial  
3 wildlife?

4 A. It's my direct evidence that the  
5 herbicides used in forestry in Ontario primarily affect  
6 wildlife by modifying their habitat.

7 Q. So you're saying that there is the  
8 possibility of impact in that particular case?

9 A. I'm saying that it modifies the  
10 habitat and that has consequences for wildlife, yes.

11 Q. Does your opinion have a high or low  
12 degree of certainty?

13 A. A high degree of certainty.

14 Q. You would agree with me that the  
15 potential for these types of impacts are highly  
16 site-specific?

17 I'm referring now -- perhaps just so that  
18 we narrow this down. Given the answers you have just  
19 given me--

20 A. Yes.

21 Q. --you can see why now I want to focus  
22 on herbicides and effects on habitat, because I think  
23 that's the point that I want to explore.

24 So when I ask all subsequent questions  
25 we're now talking about herbicides and habitat, just



1 for your clarification.

2 A. Okay, thank you.

3 Q. So I will ask you the question again:  
4 Would you agree with me that potential for these types  
5 of impacts are highly site-specific?

6 A. Yes, the modification of habitat is  
7 very site-specific.

8 Q. Can we turn to Document No. 4 which  
9 is Exhibit 607 -- 604C, it is the ESSA report.

10 A. (indicating)

11 Q. Yes. Now, when I looked through your  
12 witness statement I noted that this document, what is  
13 termed Document No. 4--

14 A. Yes.

15 Q. --is the only reference; is that  
16 correct, in your particular -- the paragraphs to which  
17 you are speaking on in your witness statement?

18 A. Yes, there were other things  
19 introduced in my direct evidence.

20 Q. Yes. I'm talking about your witness  
21 statement now.

22 A. Okay, that's correct.

23 Q. In fact, talking to your quarterback  
24 who has retired, I'm not sure to where, hopefully to  
25 Minden taking care of his forest, he indicated that you

1 would be the individual dealing specifically with  
2 documents -- this particular document; is that correct,  
3 on Panel 13?

4 MS. MURPHY: He's talking about Peter  
5 Hynard.

6 MR. KINGSBURY: Okay.

7 MR. HANNA: Q. I'm sorry.

8 MR. KINGSBURY: A. Yes, that has been my  
9 function here to talk about the ESSA Document in some  
10 depth.

11 Q. Thank you. On page 7 in that exhibit  
12 it indicates that you were an external reviewer of the  
13 study; is that correct?

14 A. Yes, I was an external reviewer of  
15 the ESSA Document.

16 Q. Did you prepare a written review of  
17 the document?

18 A. Yes, I provided some comments to OMNR  
19 on the document.

20 Q. Was this prepared in your capacity as  
21 an employee of the Canadian Forestry Service?

22 A. Yes.

23 Q. Do you have a copy of that review  
24 that you prepared with you.

25 MS. BLASTORAH: Mr. Chairman, I don't

1 think it's appropriate for Mr. Hanna to ask for copies  
2 of material that was prepared, which is not part of  
3 this document, which has been filed as part of the  
4 evidence that was prepared as background information in  
5 preparation for this hearing. I think that's  
6 privileged information.

7 THE CHAIRMAN: Well, Mr. Hanna, we sort  
8 of have some rules generally that documents going into  
9 the preparation of other documents which end up with  
10 final reports, it is the final reports which are put  
11 before the Board.

12 Positions may well change over the course  
13 of time. There may be several draft documents that end  
14 up in a final report which is the evidence being  
15 presented and the Board has, over the past number of  
16 years, drawn some lines around what kind of draft  
17 documentation is appropriate to put before the Board.

18 You can certainly ask the witness in  
19 terms of the type of advice that he perhaps gave to  
20 MNR - if that's who he gave it to - which led up to  
21 this final report being presented as the Ministry's  
22 position or ESSA's position in this case.

23 MR. HANNA: Thank you, Mr. Chairman.

24 MR. KINGSBURY: The answer to your  
25 question is no, I do not have a copy of my comments. I

1 believe I have a general knowledge of the items, some  
2 of the things that I commented on, but I know that I  
3 made quite a number of specific comments related to  
4 references or citations.

5 MR. HANNA: Q. Did your review deal with  
6 the complete scope of Exhibit 604C or was it directed  
7 to specific sections?

8 MR. KINGSBURY: A. I reviewed the entire  
9 document. Certainly there are some portions of the  
10 document that I gave considerably more attention than  
11 others because they -- because I was more directly  
12 knowledgeable about them or had more to say about them.

13 Q. Could you elaborate on which sections  
14 those are, please?

15 A. I would say that in general, of  
16 course, the direct toxic effects of insecticides was an  
17 area that I scrutinized and commented on quite closely.  
18 I certainly commented on other aspects, but in a more  
19 general nature.

20 Q. It's my understanding that the ESSA  
21 approach - and we have heard Dr. McNamee here speak to  
22 that - depends highly upon the experts partaking in the  
23 workshop procedure and that the consultants  
24 themselves - in this case ESSA - are simply  
25 facilitators and offer no specific expertise. Is that



1 your understanding?

2 A. That's correct.

3 Q. Would you agree that the reliability  
4 of the outcome of the ESSA-type of approach is highly  
5 contingent on the quality of the experts involved in  
6 the exercise?

7 A. I would agree that the information,  
8 the scientific information brought to the exercise  
9 depends, to a large extent, on the experts that bring  
10 it in or experts -- outside experts that may be  
11 commenting and providing additional information to the  
12 process through a review process.

13 Q. But there is a difference between  
14 being involved in the process and being an external  
15 reviewer. You would agree with that?

16 A. I would agree, yes.

17 Q. You did not attend any of the ESSA  
18 workshops leading up to Exhibit 604C; is that correct?

19 A. I did not attend the workshop that  
20 prepared this specific document. I was involved in a  
21 number of other ESSA workshops relating to timber  
22 management in Ontario.

23 Q. Which is captured in, I believe it's  
24 Exhibit 383 -- 318, something like that, the --

25 MS. MURPHY: The previous ESSA document--

1 MR. HANNA: Q. The effects monitoring  
2 study.

3 MR. KINGSBURY: A. Yes.

4 Q. And you were involved in that  
5 particular study?

6 MR. KINGSBURY: A. Yes, I was involved  
7 in that entire process involving a number of workshops  
8 and meetings, yes.

9 Q. And that particular exercise dealt  
10 with both the substance of your evidence here plus a  
11 number of other factors?

12 A. Yes, it went much broader than this.

13 Q. And your role at those previous  
14 workshops was in fisheries and fish toxicity; is that  
15 correct?

16 A. It was primarily in pesticide issues.  
17 There was certainly the recognition that you've made,  
18 that there's quite a difference between insecticides  
19 and herbicides in terms of the way they exert their  
20 effects, and basically I was primarily involved in  
21 assessment of direct -- the creation of the cause and  
22 effect and hypotheses relevant to fisheries and  
23 pesticides, and I was available to the people working  
24 on moose with respect to questions they had regarding  
25 herbicide effects on moose habitat.

1 Q. But you were not an author of that  
2 portion of it that dealt with herbicide effects on  
3 moose?

4 A. As you're -- I didn't do any of the  
5 direct writing of that portion, that's correct.

6 Q. But you provided input to it?

7 A. Yes.

8 Q. Now, with respect to the workshop  
9 that led to 604C--

10 A. Yes.

11 Q. --why did you not attend the  
12 workshop?

13 A. As you may or may not be aware, Mr.  
14 Hanna, I have had a change in career recently and at  
15 the point that this workshop took place and I was  
16 requested to attend, I had made commitments to my own  
17 organization to fulfill a number of obligations prior  
18 to my retirement and it was impossible to be involved  
19 in this process in a -- give it the level of input that  
20 it would have required and meet those other  
21 commitments.

22 Q. Who in attendance at the workshop  
23 offered comparable expertise to yours?

24 A. There are -- comparable expertise is  
25 a difficult term to perhaps equate, but certainly there

1 are a number of people who were participants who have  
2 been deeply involved with pesticide issues in forestry  
3 for a number of years.

4 Within the area that I believe you're  
5 primarily concerned about regarding herbicide impacts,  
6 would you like me to focus on that--

7 Q. Fine.

8 A. --that level of expertise? Certainly  
9 Dan Welsh from the Canadian Wildlife Service has not  
10 only comparable but an expertise and experience in  
11 effects of habitat change in the boreal forest of  
12 Ontario that would certainly encompass and expand on my  
13 particular expertise.

14 I believe Bob Campbell is probably as  
15 well equipped as anyone one could call upon to talk  
16 about the specific nature of the changes taking place  
17 with respect to plant communities and that, again, is  
18 an expertise that would go beyond my expertise in that  
19 area.

20 Dave Hogg, of course, with respect to  
21 wildlife and his knowledge in that area.

22 And I would suggest that many of the  
23 other people attending the workshop could make  
24 contributions and also bring perspectives to the  
25 question, many of which would encompass and capulate



1 my own expertise.

2 Q. Thank you. Now, page 6 also has a  
3 name there that we've heard before and that's Cam  
4 Clark. And I was looking here at the -- the way that  
5 this is set up and it indicates Mr. Clark was  
6 responsible for Sections 3.1 and 3.2; is that correct?

7 MS. MURPHY: Mr. Chairman, this was a  
8 question that was put in an interrogatory, in fact was  
9 answered in an interrogatory. If my friend had asked  
10 me about it, I could have clarified it for him. There  
11 is a typographical error on this page and there is no  
12 Section 3.1.

13 MR. HANNA: Thank you, Ms. Murphy.

14 Q. It's my understanding that it's  
15 common practice at these workshops to use computers and  
16 computer models; is that correct?

17 MR. KINGSBURY: A. I've been involved in  
18 ESSA workshops where that's been done, yes.

19 Q. Was this the case at these workshops?

20 A. Not having attended the workshop I  
21 have some difficulty answering that, but I believe it  
22 was not the case because, as I understand it, this  
23 workshop drew heavily on certainly -- I know it drew  
24 heavily on some of the work that had been done by the  
25 effects monitoring workshops previously.

1 Q. There was a model developed in that  
2 particular case?

3 A. That's correct.

4 Q. So do you know whether that model was  
5 further refined at this workshop or not?

6 A. I'm not aware of that.

7 Q. The model that was developed before,  
8 however, does deal -- or certain components of it deal  
9 with this matter of herbicides and wildlife habitat  
10 interactions; is that not correct?

11 A. That's correct. The model was  
12 utilized and in the earlier workshop had been used to  
13 that. However, I would caution, Mr. Hanna, from my  
14 experience with workshops run by ESSA where the model  
15 is used, that one needs to be very aware of what the  
16 use of the model is.

17 I think you would appreciate that anyone  
18 who would attempt to create a simulation model that is  
19 capable of making predictions, et cetera, in the space  
20 of three or four workshops of a few weeks' duration  
21 would be fooling themselves.

22 And I believe that the ESSA process - and  
23 I know that Dr. McNamee has presented evidence in Panel  
24 8 on the process, although I don't have that in front  
25 of me - clearly spells out that the model is being used

1 not to simulate and make predictions, it is being used  
2 as a tool to assist people in conceptual ways, and I  
3 would refer you back to Dr. McNamee's evidence to  
4 expand on that.

5 Q. He has been quite elaborate on that,  
6 I don't think we need to go further. Can we turn to  
7 page 2 of 604C under Section 1.2?

8 A. Yes.

9 Q. The first paragraph there. I'm  
10 looking at the second last sentence, it says -- well,  
11 perhaps the two sentences there:

12 "This document does not constitute an  
13 environmental assessment of the use of  
14 pesticides for timber management. It is  
15 simply a presentation of the evidence for  
16 environmental effects."

17 A. Yes.

18 Q. Do you see that? Would you say that  
19 it's adequate to simply present evidence of effects, or  
20 would you say that it's necessary for an environmental  
21 assessment to take the evidence of environmental  
22 effects --

23 MS. MURPHY: This is a question of law in  
24 my view. It sounds like it.

25 MR. HANNA: It's not a question --

1 THE CHAIRMAN: Let's hear the whole  
2 question and then we will determine that.

3 MR. HANNA: Q. Would you say, as a  
4 scientist performing environmental assessment, that it  
5 is adequate to simply present evidence of effects, or  
6 would you say that it is necessary to take the evidence  
7 of effects and to use that in a predictive way to  
8 analyse the consequences of a given action?

9 MS. MURPHY: Adequate for what purpose?

10 THE CHAIRMAN: Well, certainly not to  
11 comply with the Environmental Assessment Act, per se,  
12 that's clearly a question of law.

13 MS. MURPHY: Thank you.

14 THE CHAIRMAN: But if what you are asking  
15 this witness is: As a scientist, do you feel that it  
16 is adequate to just present effects; i.e., imperical  
17 evidence as to what occurs, as opposed to taking it a  
18 step further and using that knowledge for predictive  
19 results in the future?

20 MR. KINGSBURY: As I understand the  
21 question, Mr. Hanna, your question incapsulates a lot  
22 of things that I've talked about in my direct evidence  
23 and that is -- at the risk of perhaps going back and  
24 covering some old material, I just --

25 MR. HANNA: Excuse me --



1                   MR. KINGSBURY: The way I understand the  
2 process, the federal registration process would  
3 primarily deal with assessing evidence for effects,  
4 imperical data saying that this material applied causes  
5 these things to happen.

6                   I would then suggest that in terms of  
7 doing an assessment, and that captures a whole bunch of  
8 things, environmental assessment, that one of the  
9 things with respect to pesticide effects is that that  
10 requires looking at the specific site, the quality of  
11 the site, the size of an application rate, timing of  
12 application, all those parameters in order to come up  
13 with an assessment of what the effects might be on,  
14 say, for instance, moose habitat.

15                  As I spelled out in my direct evidence,  
16 that's a step that, with forestry pesticides, is dealt  
17 with by the classification of these pesticides in a  
18 restricted category requiring a provincial use permit  
19 which allows for site-specific consideration of the use  
20 of a product and the imposition at that time of things  
21 like buffer zones and leave strips and whatever, as  
22 deemed suitable.

23                  MR. HANNA: Q. I understand what you're  
24 saying, and I should just point out to you, while I was  
25 not here for Mr. Castrilli's cross-examination or Ms.

1 Cronk's, I have their transcripts, I have read your  
2 evidence-in-chief, just so that you appreciate that I  
3 have read that. So...

4 A. Okay. Did I answer your question,  
5 Mr. Hanna, with what I was saying? I think I'm just --  
6 I'm simply trying to say that you've asked me, as a  
7 scientist, what's needed to do an environmental  
8 assessment and I was ---

9 Q. Okay. Let me just parse this down,  
10 it may be easier to deal with.

11 My understanding of the registration  
12 process, at that time you're primarily looking at  
13 toxicological effects that are generic, okay, so you  
14 look and you -- in fact, I will submit to you that the  
15 effects on habitat, indirect effects, have virtually  
16 never been looked at in the registration of a product?

17 A. Would you -- I guess I would consider  
18 the fact that you're looking at the effect of the  
19 product on plants and animals and forest substrates, if  
20 you want to call that, that serve as habitat, I  
21 believe --

22 Q. That's fine to talk about habitat,  
23 but what you have to translate that into to be  
24 meaningful, in terms of making a social policy  
25 decision, is what the consequences are in terms of

1 wildlife, the animals that use that habitat.

2 And I've yet to see in any of the  
3 decisions I've seen come down from that -- I've seen  
4 talk about moose and the impact on moose populations  
5 when, for example the registration of glyphosate was  
6 being considered.

7 MS. CRONK: Excuse me, sir. Two levels,  
8 the first is, is that a question, and I don't mean to  
9 be upstandish, but it is important that questions be  
10 put to the witness.

11 Secondly, as I heard the question, it is  
12 attempting to elicit an answer on a social policy  
13 perspective or a philosophy in management from a social  
14 policy point of view. The question reframed would  
15 likely not be objectionable, certainly from our  
16 client's point of view if it were rephrased.

17 MR. HANNA: Thank you.

18 THE CHAIRMAN: I think both of those  
19 objections are well founded, Mr. Hanna.

20 MR. HANNA: Yes, Mr. Chairman.

21 MR. KINGSBURY: The point I was trying to  
22 make --

23 MR. HANNA: Q. Can you indicate to me,  
24 Mr. Kingsbury, a situation that you're familiar with in  
25 terms of a product being registered, whereby the

1 effects on large ungulate populations, indirect effects  
2 on habitat and subsequent effects on population were  
3 considered in the decision, and who provided that  
4 information?

5 MR. KINGSBURY: A. I think perhaps what  
6 you're looking for, Mr. Hanna, is an indication as to  
7 what extent does the federal registration process in  
8 registering a material take into account what the  
9 potential implications of use of that material might be  
10 on moose populations in Ontario, as a for instance. Is  
11 that a fair assessment?

12 Q. As opposed to other chemicals that  
13 might be currently registered, correct.

14 A. I think that what the federal  
15 registration process attempts to do is generate  
16 specific data that says this material is effective for  
17 the use as claimed and that this material does not  
18 impose direct effects on non-target organisms.

19 Q. Toxicological effects?

20 A. Which would be toxilological effects,  
21 and it basically makes available data which would give  
22 a user the potential to say if we use this material we  
23 are expecting a certain result. In fact, the  
24 registration process, more or less, guarantees that if  
25 used appropriately it should have a desired effect.



1                   The fact that that desired effect is  
2           going to modify habitat, I would suggest, is inherent  
3           in the fact you are using the pesticide. Whether it be  
4           an insecticide or a herbicide, it will have some impact  
5           on the nature of the site where it's utilized.

6                   Q. All right.

7                   A. I don't believe that the federal  
8           process goes further to then say: Well, what would  
9           happen if this was used everywhere. It basically  
10          becomes the decision of the user with that knowledge in  
11          hand.

12                  Q. So it's not - just to incapsulate  
13          what you're saying - it's not captured, those  
14          site-specific decisions are not captured in the  
15          registration review process?

16                  A. They are not captured, but the  
17          requirement for consideration of those site-specific  
18          parameters is imposed by putting these materials in  
19          their restricted classifications.

20                  Q. Okay. Now, back to where we started  
21          here in terms of that original question.

22                  A. Okay.

23                  Q. I'm referring back now to page 2  
24          there, this business about presentation of evidence.  
25          And my question is simply: Is it adequate to present

1 evidence of effects - as a scientist I'm asking you  
2 this question - in terms of providing information for  
3 an environmental assessment, and you've had experience  
4 in environmental assessment, to predict -- to take that  
5 imperical evidence and to put that into a form that you  
6 have to forecast, you have to predict?

7 A. Mr. Hanna --

8 MS. MURPHY: It's adequate for what  
9 purpose?

10 THE CHAIRMAN: Mr. Hanna, we are having  
11 some difficulty here because obviously the ESSA report  
12 in itself is not meant to be the complete environmental  
13 assessment, it is looking at certain effects of certain  
14 products, both the toxicology and other effects, but  
15 surely when you are designing an environmental  
16 assessment of the overall question in timber  
17 management, which would include impacts on terrestrial,  
18 wildlife, fisheries, humans, et cetera, you are taking  
19 into account much more.

20 And so I don't think -- if you are  
21 casting your questions in the light of: Is what ESSA  
22 did here, in essence, an environmental assessment,  
23 surely it's not the environmental assessment that's  
24 before the Board. It certainly, in itself, would  
25 probably not meet the requirements of the Act.

1 MS. MURPHY: As it says itself in the  
2 document.

3 THE CHAIRMAN: That's right.

4 MR. HANNA: Mr. Chairman, just to  
5 clarify, I'm not challenging that in any way. That's  
6 not the purpose of the direction of my question.

7 THE CHAIRMAN: Well, you are bordering on  
8 using terminology, in any event, that causes some  
9 distress both to the Board and I would suggest to other  
10 parties because environmental assessment has a very  
11 different meaning to different people, including a  
12 statutory meaning.

13 So I think you are going to have to make  
14 your questions more precise as to exactly what you are  
15 getting at, so that we will see whether it is within  
16 the expertise of this witness and within the ESSA  
17 documentation upon which he is commenting to answer.

18 MR. HANNA: I must admit, I am stumbling  
19 with thinking of an alternate word to talk about  
20 environmental impact assessment other than  
21 environmental impact assessment.

22 THE CHAIRMAN: Well, I don't think it is  
23 just a mere matter of substituting a word for that.

24 MS. MURPHY: If it helps, Mr. Chairman,  
25 the Ministry of Natural Resources will agree that this

1 document is not an environmental assessment. It's part  
2 of the evidence being presented in this environmental  
3 assessment.

4 We will also agree that the federal  
5 registration process does not make site-specific  
6 decisions about the use of a product. Does that help?

7 THE CHAIRMAN: And that was never the  
8 intention of the ESSA Document or the ESSA exercise.

9 MR. HANNA: I think I understand that  
10 quite clear, Mr. Chairman. I appreciate Ms. Murphy's  
11 assistance there, but it's really a fundamental  
12 question.

13 I'm talking about whether environmental  
14 impacts are a forecasting exercise; in other words, one  
15 where you are predicting something into the future or  
16 where you are monitoring past effects.

17 Q. Do you see environmental impact  
18 prediction as being a central requirement to...

19 THE CHAIRMAN: To what, register the  
20 product?

21 MR. HANNA: No, not at all. I'm trying  
22 to move away from the registration issue. I accept  
23 what Ms. Murphy has said and I agree with what she has  
24 said.

25 What I am now looking at now and saying:



1 This particular document, it was my understanding, is  
2 certainly not the environmental assessment, I have no  
3 illusions of that. It is being put forward as one of  
4 the elements of the environmental assessment, that  
5 element that deals with the impact of pesticides on  
6 terrestrial and aquatic systems.

7 And I'm -- the report says point blank  
8 this is a presentation of the evidence for  
9 environmental effects. I'm asking this witness: Is  
10 that adequate, or do you have to take that one step  
11 further; in other words, take that evidence and then  
12 put it in a form whereby predictions can be made?

13 THE CHAIRMAN: Well, I think the witness  
14 has already alluded in his direct testimony to the fact  
15 that the product is registered and then you go down to  
16 a secondary process at the provincial level of  
17 site-specific considerations and there is a licensing  
18 process in fact that would consider, to some extent,  
19 where and in what quantities - well, not in what  
20 quantities in terms of the product - but where and what  
21 areas over which the product could be used.

22 And correct me if I'm wrong, Mr.  
23 Kingsbury, but just to use a hypothetical example: If  
24 you had a licensed product that was an effective  
25 herbicide and it would affect moose habitat in terms of

1 wiping out all of the necessary vegetation to support  
2 moose, even though you could use it perhaps in an area  
3 where there were no moose, there would be other  
4 considerations taken into account, site-specifically,  
5 if you wanted to use it in an area which had abundant  
6 moose and their habitat would be affected materially if  
7 you so used it, but that would be a secondary  
8 consideration to the licensing and registration of the  
9 product and the effects noted from the use of that  
10 product as a herbicide; is that not correct?

11 MR. KINGSBURY: That's correct. And, of  
12 course, it's implicitly recognized in the federal  
13 process that's a provincial jurisdiction.

14 THE CHAIRMAN: And both MNR and the  
15 Ministry of the Environment, which oversees the  
16 provincial licensing registration process or permitting  
17 system, would take into account some of those habitat  
18 concerns; would they not?

19 MR. KINGSBURY: That's correct.

20 MR. HANNA: Q. Mr. Kingsbury, the next  
21 two paragraphs on page 2 provide a general description.  
22 I believe it's intended to be a brief summary of, I  
23 believe the terms are, the necessary ingredients of a  
24 comprehensive environmental assessment, not in any way  
25 attempting to try and suggest that this is, but it goes

1 through -- but these are sort of the elements that you  
2 would want to see to undertake an environmental  
3 assessment; is that not correct?

4 MR. KINGSBURY: A. I'm sorry, Mr. Hanna,  
5 you lost me there.

6 Q. Okay. Would you look under Section  
7 1.2.

8 A. Yes.

9 Q. The last sentence in the first  
10 paragraph.

11 A. "The necessary ingredients...", Yes.

12 Q. Okay. And the next two paragraphs  
13 just give a very, very brief summary of the elements  
14 that are seen by these authors as might be in an  
15 environmental assessment.

16 MS. MURPHY: Well ...

17 MR. HANNA: They are the words in the  
18 report, Mr. Chairman.

19 MR. KINGSBURY: They are the necessary  
20 ingredients for an environmental assessment. I don't  
21 think I disagree, Mr. Hanna, I just wanted to be clear  
22 what the question was you were asking me.

23 I think what it spells out here is that  
24 an environmental assessment considers looking at what  
25 you want to do, how you could go about doing it, and

1       then examining what the potential impacts of the  
2       various options might be.

3                   MR. HANNA:  Q.  Precisely.  It's that  
4       last element, last phrase you just used that I really  
5       want to focus on and that is the potential impacts.

6                   A.  Yes.

7                   Q.  How do you determine the potential  
8       impacts?

9                   MS. MURPHY:  Of what?

10                  MR. HANNA:  The witness' words.

11                  MR. KINGSBURY:  If you want to determine  
12       the potential impacts of a pesticide, then you go to  
13       evidence that speaks to what that pesticide does, what  
14       does it do to plants or animals or moose or whatever.

15                  MR. HANNA:  Q.  But then you have to  
16       predict into the future; is that not correct?  It's not  
17       adequate to simply look at what's happened in the past,  
18       you have to look and see what would likely happen in  
19       the future with the particular proposition that is  
20       being put forward?

21                  MR. KINGSBURY:  A.  Yes.  Well, one of  
22       the effects of a herbicide obviously would be to modify  
23       plant communities on the site.

24                  Q.  And you know that from past imperical  
25       evidence?



1                   A. Yes.

2                   Q. But then you have to say: Okay,  
3 well, I know it's going to modify plant communities, I  
4 then have to say: What are the consequence of that?  
5 I am going to have to project that into the future, I  
6 have to look at a specific case and say: What are the  
7 consequences I have to predict. Is that not correct?

8                   A. If you want to say what's that going  
9 to mean in terms of moose communities, then you would  
10 have to say: Well, what are the consequences of that  
11 and at that point you have to draw on another body of  
12 direct imperical evidence which would be: What are the  
13 habitat requirements of moose and how do moose respond  
14 to changes in plant succession on the site, correct.

15                  Q. Well, that's fine. Now, the last  
16 sentence there continues on to the next page and starts  
17 with:

18                   "Once the environmental effects of all  
19 methods have been satisfactorily  
20 examined, can a rational decision be  
21 made."

22                   Do you see that sentence?

23                   A. Yes.

24                   Q. What is your interpretation of "have  
25 been satisfactorily examined" in this context?

1                   A. To me that would mean, I believe in  
2 the context we are talking about, once the habitat  
3 modifications which would result from all of the  
4 options being considered have been examined.

5                   Q. Which are predicted to result?

6                   A. Once -- that's correct, once the  
7 predicted changes in the qualities of the site which we  
8 would say are habitat qualities are predicted, then a  
9 judgment could be made.

10                  Q. So you would agree with me that it  
11 requires the prediction of environmental effects of  
12 different components of the eco-system, this process?

13                  A. Yes.

14                  Q. Where in your evidence do you talk  
15 about predictive tools that could be used by forest  
16 managers to deal with environmental consequences of  
17 herbicide use?

18                  THE CHAIRMAN: I don't think, Mr. Hanna,  
19 that Mr. Kingsbury is dealing with the predictive tools  
20 or the question that you are asking. I think that was  
21 dealt with by a number of other witnesses throughout  
22 the past year.

23                  MR. HANNA: Mr. Chairman, perhaps I have  
24 got a bad memory. I'm not familiar at all with that  
25 evidence, I mean, a witness that has come forward

1 talking about how herbicide impacts should be predicted  
2 in terms of moose populations.

3 MS. MURPHY: Well, Mr. Hanna, can  
4 interpret the evidence in any way he chooses to and  
5 that is fine. Today I'm here to tell you that Mr.  
6 Kingsbury is not here to talk about predictive tools.

7 MR. HANNA: Or predicting the effects of  
8 herbicides on terrestrial wildlife.

9 MR. KINGSBURY: Mr. Hanna, I'm having  
10 some problem with the line of questioning because in my  
11 effort to assist you it seems that I'm unable to  
12 satisfy your questions and I'm not sure why that is.

13 What I'm suggesting is that when you  
14 apply a pesticide you modify habitat through the action  
15 of that pesticide and that those are modifications for  
16 which we generate some data that helps us to define  
17 what those changes will be.

18 And I think that -- obviously there is a  
19 time frame in which all of this takes place and, if you  
20 modify the nature of the site in a certain way you know  
21 that that, in turn, may have consequences on what  
22 habitat qualities that site will contain for virtually  
23 an infinite period of time, unless something else comes  
24 along and modifies it in the interim.

25 I believe that there can in fact be --

1       this kind of evidence is sufficient to, in your words,  
2       have predictive capabilities and predict what the  
3       ultimate consequences to wildlife species might be,  
4       because I'm aware of quite a number of situations where  
5       wildlife managers say: We would like to change a site  
6       and we can use pesticides as one of the ways to do it,  
7       just as we could use fire as a way to do it, or manual  
8       thinning as a way to do it.

9                       In fact, pesticides have been a major --  
10       one of the major tools available to wildlife managers  
11       to manage wildlife.

12                      THE CHAIRMAN: Mr. Hanna, aren't we  
13       getting really involved in the whole concept that we  
14       have dealt with I think at length in this hearing of  
15       integrated resource management to the extent that we  
16       have pesticides, we have toxicological effects of  
17       pesticides or insecticides, and those deal with the  
18       direct effects on wildlife and humans, et cetera. And  
19       Mr. Kingsbury has indicated that the use of pesticides  
20       will alter habitat. That, in fact, when you are  
21       dealing with herbicides is their purpose, as I  
22       understand it.

23                      As to the effect on the wildlife of using  
24       the pesticides, other experts in wildlife management  
25       will take that imperical knowledge and apply it



1 vis-a-vis the requirements of the wildlife for which  
2 they are charged with protecting.

3 So you are going to have your wildlife  
4 biologists who are going to supposedly take into  
5 account the use of pesticides in a certain way and what  
6 their effect will be on the particular specie or  
7 species that they are attempting to protect and  
8 enhance.

9 And that is the whole concept, I think,  
10 of integrated resource management that we have dealt  
11 with. I think that is probably the reason why, in the  
12 ESSA workshops, you have a variety of consultants with  
13 a variety of expertise in both toxilological effects,  
14 wildlife management, plant management, et cetera. And  
15 that is so you can predict, to some extent, if you know  
16 what the effect is, how you can best manage.

17 And I think this is -- you know, you are  
18 trying to get into an area that we have covered  
19 peripherally through several other panels of witnesses.

20 MR. HANNA: Well, Mr. Chairman, I  
21 appreciate what you are saying and I think your  
22 comments are quite appropriate in the one respect with  
23 respect to integrated resource management.

24 However, the document that I'm now  
25 dealing with Exhibit 604C, and I'm looking specifically

1 on page 42, actually lays out the mechanism whereby  
2 those impacts could occur.

3 And at the top of that indicates the  
4 final outcome of those impacts as altered abundance and  
5 distribution of terrestrial animals. That is the  
6 output of, if you will, hypothesis No. 1.

7 MS. MURPHY: That is the hypothesis. As  
8 it explains in the document, that is the hypothesis  
9 that the group is looking at.

10 MR. HANNA: And it is the hypothesis that  
11 I would like to speak to this witness about, Mr.  
12 Chairman. And I would say to you that that -- I have  
13 no other way to interpret that but to say, that  
14 suggests that if you follow - and I'm particularly  
15 concerned here with Link 5 as I will deal with  
16 shortly - indicates: Here is the sequence that takes  
17 place in affecting things of importance to people, not  
18 habitat but moose.

19 And it's that sequence and that  
20 connection that I wish to explore with this witness  
21 and I do not see that as being -- I can see it like  
22 everything in this hearing, integrated resource  
23 management is integrated throughout everything we  
24 discuss, but this is very specific for the use of  
25 herbicides and the evidence of this witness.

1                   MR. MARTEL: Are you attempting to try to  
2 find a method of quantifying what has been predicted?

3                   MR. HANNA: Mr. Martel, what I -- I guess  
4 where I'm going is: This document provides a great  
5 volume of information to the Board. I think it's very  
6 hard for the Board to assimilate that type of  
7 information. And I'm trying to look at a way to  
8 distill that down in a way that we can say: Okay, here  
9 is the useful outcome of that that can be used in the  
10 future in the planning process to assess on a  
11 case-by-case basis, for example, the use of herbicides  
12 on a specific site.

13                  MR. MARTIN: And what will occur. You  
14 are trying to predict what will occur and then quantify  
15 that to determine whether or not, in fact, that will  
16 occur the way it's predicted it's going to occur.

17                  MR. HANNA: Precisely, to put the context  
18 that that would be used in the future on an individual  
19 case-by-case situation when a timber management plan is  
20 prepared.

21                  THE CHAIRMAN: So put your next question.  
22 Let's go question by question.

23                  MR. HANNA: Q. Mr. Kingsbury, can you  
24 turn to page 42, please.

25                  MR. KINGSBURY: A. Yes, I'm there.

1                   Q. Figure 2. I believe we have agreed  
2                   in an earlier question that the information available  
3                   for the links that are described here as 1, 2, 3 and 4  
4                   which are basically, if you will, the toxicological  
5                   side of the hypothesis, the available information is  
6                   quite extensive relative to linkage 5; is that not what  
7                   we agreed to?

8                   MR. KINGSBURY: A. The data that is --  
9                   the information within the ESSA Document itself?

10                  Q. I was speaking more broadly than  
11                  that.

12                  THE CHAIRMAN: Sorry, Mr. Hanna, I think  
13                  I have lost you. Where are you in this document?

14                  MR. HANNA: I'm sorry, Mr. Chairman. I'm  
15                  on page 42.

16                  THE CHAIRMAN: 42.

17                  MR. HANNA: And 42 is Figure 2 in my  
18                  copy.

19                  THE CHAIRMAN: Okay, thank you.

20                  MR. HANNA: And I'm looking at the  
21                  hypothesis --

22                  Q. Perhaps, Mr. Kingsbury, maybe you  
23                  could just explain to us that diagram. I don't whether  
24                  that diagram has -- has any of the hypothesis been  
25                  discussed in your direct evidence?



1                   MR. KINGSBURY:  A.  We basically have  
2       been dealing with all of the hypotheses in there in a  
3       general way, yes.

4                   Q.  You might just explain though the  
5       structure of that, just to clarify how to interpret  
6       that...

7                   THE CHAIRMAN:  Ms. Murphy?  Just a  
8       moment.

9                   MS. MURPHY:  I would just like to point  
10      out that the description of what these things mean and  
11      how to interpret them begins on page 142, for your  
12      reference.

13                  MR. HANNA:  I was simply asking to try  
14      and expedite things at this time.  We can defer it to  
15      that appendix.

16                  Q.  If you can just give us a very brief  
17      synopsis of just how to interpret that diagram.  I  
18      appreciate it's described Appendix A Mr. Kingsbury.

19                  MR. KINGSBURY:  A.  I think you will find  
20      that my direct evidence was basically just that, it was  
21      an attempt to say that you can have -- pesticide  
22      effects can occur through either direct toxic effects,  
23      okay - which of course is taking you to the left side  
24      of the diagram that then; one, change the abundance or  
25      distribution of animals or; secondly, can indirectly

1       affect, because they change prey availability and,  
2       consequently, may lead to a reduction in abundance,  
3       distribution of terrestrial animals; or they can change  
4       the habitat parameters which indirectly affects  
5       organisms.

6                   In order to understand how that acts, one  
7       needs an understanding of information that says how --  
8       what are the habitat needs of an organism, how does an  
9       organism respond to changes in its environment.

10                   Q.   So just -- those are two very  
11       important points.  You, first of all, have to describe  
12       what the habitat needs are?

13                   A.   Yes.

14                   Q.   When I say describe, you are talking  
15       there as quantitatively as possible; would you agree  
16       with that?

17                   A.   And a description of the habitat  
18       needs of an organism is something that has nothing to  
19       do with pesticides.

20                   Q.   I appreciate that, but you would like  
21       that description as quantitatively as possible?

22                   A.   Ideally if we knew exactly what the  
23       needs would be, presumably we would be most capable of  
24       having the resultant numbers and distribution of those  
25       animals that we might choose to have, yes.

1 Q. And the second thing that you  
2 indicated we need is then how the animal interacts with  
3 those habitat elements; is that correct?

4 A. That's correct. I'm not sure that I  
5 see them as being terribly separate items though.

6 Q. And linkage No. 5, which is the link  
7 that goes to the right-hand side of the drawing--

8 A. Yes.

9 Q. --deals with the effects of  
10 herbicides, deals with pesticides, but seeing we have  
11 just agreed that herbicides are the ones that affect  
12 habitat--

13 A. Yes.

14 Q. --that that's the effects of  
15 herbicides on habitat?

16 A. Yes.

17 Q. And it's consequence of that in terms  
18 of abundance and distribution of animals, terrestrial  
19 animals?

20 A. Okay. You see there is two steps in  
21 the process there.

22 Q. Right.

23 A. And I might suggest that the first  
24 step, going from the application of the herbicide - if  
25 you want to limit it to herbicide - results in changes

1 in the habitat, the community structure of the plant  
2 community in the case of a herbicide on that site.  
3 That is information relevant to the herbicide's effects  
4 on plants largely.

5 That the next step, going from the  
6 changes in the habitat and the community's structure to  
7 the change -- to altered abundance, distribution of  
8 terrestrial animals, is reliant on a totally different  
9 body of knowledge which is what are the habitat  
10 requirements of organisms.

11 Q. And both of those are captured in  
12 Link 5?

13 A. Basically, Link 5 says that that is  
14 the hypothesis: You change the habitat and animal  
15 communities respond.

16 I guess -- if I might, I guess the point  
17 I'm trying to make is that there are two rather  
18 different bodies of imperical data required to assess  
19 that link. One is: What does the pesticide do to the  
20 habitat, and the second is: How do animal communities  
21 or a given species respond to changes in its habitat.

22 Q. And it requires that those two be  
23 linked?

24 A. It doesn't really require that the  
25 two be linked because the first step simply says: You



1       apply the pesticide and the habitat will change. Okay.

2                   Q. But if I predict a habitat component  
3       that is defined entirely different than the way I'm  
4       defining habitat in terms of my population, it's going  
5       to be meaningless, they have to be in the same terms,  
6       they have to be able to be linked?

7                   A. I guess what you are saying is, this  
8       hypothesis does not start with the altered abundance,  
9       distribution of terrestrial animals, it starts with the  
10      pesticide. And what this hypothesis is saying is: If  
11      you work through the hypothesis you will eventually get  
12      to that change.

13                  And I think I have an understanding now  
14      of what you are saying. If we said that the  
15      application of the pesticide altered the habitat by  
16      removing all browse available for ungulates, that going  
17      from 5 to -- from that change in habitat to the next  
18      step, one would assume that if ungulates need browse  
19      they would not -- that habitat would not fulfill any  
20      requirement for them. Okay. That is what this tells  
21      you.

22                  If you want to start at the point of  
23      saying: We would like, you know, .5 moose per hectare,  
24      you can't work backwards through the process. What you  
25      can say is: If we want a certain number of moose, then

1       you have to define the habitat that would basically  
2       produce that number of moose. The.

3                       First step in the data would allow you to  
4       say how a use of a pesticide could provide certain  
5       habitat qualities.

6                       THE CHAIRMAN: Well, isn't it, I'm not  
7       trying to trivialize it, but a simple procedure to say:  
8       This is the effect of the pesticide, this is the  
9       particular terrestrial animal we are looking at, this  
10      is what the requirement of that animal is in terms of  
11      habitat, and our use of the pesticide will either allow  
12      that amount of habitat to be preserved to support that  
13      population or it won't.

14                      MR. KINGSBURY: In many cases it is a  
15      simple exercise. For instance, if we are talking about  
16      a song bird that we know nests only in the top of  
17      conifer trees and the action you are talking about is  
18      cutting down conifer trees, it's pretty simple. You  
19      know what you will do in terms of modifying habitat and  
20      how the population will respond.

21                      THE CHAIRMAN: In evaluating --

22                      MR. KINGSBURY: Which is...

23                      THE CHAIRMAN: Excuse me a moment.

24      In evaluating the pesticide you are trying to gain as  
25      much knowledge as to what the effects are, both direct

1 and indirect, through habitat on as many species of  
2 wildlife that you may be concerned with in any  
3 particular point in time?

4 MR. KINGSBURY: That's correct. As I  
5 pointed out in direct, what is really important to  
6 consider when we are talking about herbicide uses in  
7 forestry is that herbicide uses are almost invariably  
8 something that -- an action that takes place on a site  
9 where previous actions, generally harvesting and  
10 sometimes harvesting and site preparation and planting,  
11 have already had a very substantial effect in terms of  
12 changing the habitat available on that site.

13 MR. HANNA: Q. And you would agree with  
14 me, Mr. Kingsbury, that the example you gave was in  
15 fact a fairly simple one, but it's not so simple, if  
16 for example you were looking at availability of browse  
17 for large ungulates, that there's a gradation of  
18 effects; in other words, it's not simply yes or no, but  
19 that there is various levels of effects that might  
20 possibly be exhibited on the population?

21 MR. KINGSBURY: A. And basically I agree  
22 with you in that: One, the herbicide is going to  
23 affect different browse species differently and;  
24 secondly, that those effects will in terms of how they  
25 are expressed on browse available, over time you will

1 be dealing with a continual change in browse  
2 availability on that site that, for many years, will be  
3 a reflection of the fact that a herbicide was used  
4 there.

5 Q. But it's not a simple matter that a  
6 moose needs "x" kilograms of browse per year to  
7 survive; if he's got lots of browse, he can eat a lot  
8 and get fat, and if he hasn't got a lot of browse, he  
9 can eat less and get skinny; is that not correct?

10 In other words, it's not a: Yes, we're  
11 going to have a moose or not we're going to have a  
12 moose, but there's a whole range of effects that might  
13 occur in terms of the response of the wildlife  
14 population?

15 A. And that there many other habitat  
16 qualities that need to be taken into consideration.

17 Q. Exactly.

18 THE CHAIRMAN: Is not that taken into  
19 account by the wildlife manager--

20 MR. KINGSBURY: Absolutely.

21 THE CHAIRMAN: --in managing the  
22 resource, in his case, wildlife?

23 MR. KINGSBURY: I suspect that the  
24 evidence that has been presented to this Board is that  
25 aside from - and maybe I'm outside of my area - aside



1 from modifying harvest rates, the way in which --  
2 virtually the only way wildlife managers manage  
3 wildlife is by managing their habitat.

4 MR. HANNA: Mr. Chairman, it might be an  
5 appropriate time for me to take a break.

6 THE CHAIRMAN: Okay. 15 minutes.

7 MS. CRONK: Excuse me, Mr. Chairman, just  
8 before you rise.

9 Mr. Hanna has made it clear, as I  
10 understand it, that he has no questions for Dr. Ritter,  
11 that all of his questions are going to be directed to  
12 Mr. Kingsbury and it occurred to me, as I sat here,  
13 that perhaps in the circumstances Dr. Ritter could be  
14 allowed to stand down. It may be that there is other  
15 matters that he could...

16 MS. MURPHY: Actually, I prefer to  
17 consider that over the break, because it's very  
18 difficult to know whether a question will come up that  
19 in fact deals with toxicity or interpretation of...

20 MS. CRONK: I think that's fine.

21 THE CHAIRMAN: I think that's a decision  
22 that really has to be made by Ms. Murphy.

23 MS. CRONK: That's fine. It just  
24 occurred to me as a possibility.

25 THE CHAIRMAN: Thank you. 15 minutes.

1 ---Recess taken at 10:27 a.m.

2 ---On resuming at 10:50 a.m.

3 THE CHAIRMAN: Thank you. Be seated,  
4 please.

5 DR. RITTER: Mr. Chairman, I wonder if I  
6 could just very quickly provide some information on  
7 some of the homework I was given yesterday, just one  
8 point.

9 One of the things that I was requested to  
10 submit was the letter regarding the 2,4-D situation  
11 between the Minister of National Health and Welfare and  
12 the Minister of Environment and Muncipal Affairs, which  
13 is the correct department name, in New Brunswick.

14 I have now been advised that that letter  
15 cannot be released and that further consideration could  
16 only be given to that request following a formal  
17 request to the Access to Information Officer in Ottawa.

18 THE CHAIRMAN: Well...

19 MS. MURPHY: It was Mr. Castrilli's  
20 request. I guess he is going to have to consider what  
21 exactly he wants to do with it.

22 DR. RITTER: It falls within the general  
23 guideline of what is considered Cabinet confidences  
24 and, as I had indicated yesterday, I had my doubts that  
25 in the first instance it would be released.

1 THE CHAIRMAN: Okay. I assume Mr.  
2 Castrilli is following the transcripts and so will be  
3 apprised of this. But, Ms. Murphy, could you undertake  
4 to at least advise either him or Ms. Swenarchuk, who I  
5 understand is taking over from him when we return.

6 MS. MURPHY: Yes, I will certainly do  
7 that.

8 THE CHAIRMAN: Thank you.

9 MS. MURPHY: Was there anything else?

10 DR. RITTER: (nodding negatively)

11 MS. MURPHY: There was a suggestion made  
12 before the break. Dr. Ritter I understand is quite  
13 grateful and, in fact, is attempting to change counsel  
14 right at this time.

15 I'm content to have Dr. Ritter stand down  
16 if that's acceptable to you. However, I would like him  
17 to stay and be in the room in the event that something  
18 comes up that he can be of assistance on.

19 THE CHAIRMAN: The stand down is not the  
20 stand down you were expecting, Dr. Ritter. Very well.

21 DR. RITTER: I will nevertheless take  
22 that offer, Mr. Chairman.

23 MR. HANNA: If I have any questions for  
24 you, Dr. Ritter, I will give you five minute's notice  
25 or whatever. I don't expect there will be any,

1       however.

2                       Q.   Mr. Kingsbury, we left off before the  
3       break dealing with page 42 in Exhibit -- page 2, Figure  
4       2 -- I'm sorry, page 42, Figure 2?

5                       MR. KINGSBURY:   A.   Yes.

6                       Q.   Just to be clear, we were talking  
7       about linkage 5--

8                       A.   Yes.

9                       Q.   --which is that one that deals with  
10      the habitat modification impacts of pesticides?

11                      A.   Yes.

12                      Q.   You would agree that ungulates are  
13      directly affected in a potentially significant way  
14      through linkage 5?

15                      A.   It is in fact the only way in which  
16      they are likely to be significantly affected.  I would  
17      suggest it is the only way in which they are likely to  
18      be significantly affected through habitat change.

19                      Q.   Thank you.  Now, I'm wondering if  
20      you've done any studies in Ontario dealing with linkage  
21      5 in your work with the Canadian Forestry Service or  
22      elsewhere?

23                      A.   With respect to ungulates?

24                      Q.   Yes, or other species, but ungulates  
25      is what I'm concerned about at the present time.



1                   A. I know we have not conducted any work  
2 with ungulates in terms of actual field studies, if  
3 that's your question.

4                   Q. Yes. Has the Canadian Forestry  
5 Service, as far as you know, undertaken - or other  
6 federal departments - undertaken any studies dealing  
7 with this problem in Canada?

8                   A. When you speak of this problem in  
9 Canada, could you please specify --

10                  Q. Certainly. Let's just deal with  
11 ungulates. The impacts associated with linkage 5.

12                  A. Yes.

13                  Q. Have there been field studies  
14 undertaken by Canadian Forestry Service, Canadian  
15 Wildlife Service or related agencies on ungulates in  
16 Canada?

17                  A. There have been studies that have  
18 been funded and partially carried out by those agencies  
19 that would be evaluating things such as the utilization  
20 of herbicide-treated areas by moose, browse  
21 availability.

22                  Q. And are those listed in your evidence  
23 anywhere?

24                  A. If I can just take a look. When you  
25 say my evidence, are you referring to -- you're

1 including the ESSA Document?

2 Q. Well, I believe you're taking  
3 responsibility for the ESSA Document and, therefore, I  
4 gather it's your evidence too?

5 A. That's correct. I would have to go  
6 through these references one at a time. If you want to  
7 say did CFS or CWS do this, I would refer you to the  
8 work that's perhaps best summarized in page 72.

9 Q. Mm-hmm.

10 A. The section under big game there.

11 Q. Mm-hmm.

12 A. And if you'd like to go through and  
13 discuss these...

14 Q. Well, we are going to be going  
15 through those, so--

16 A. Okay.

17 Q. --maybe we can just defer that until  
18 the present time -- or to that time. But you're not  
19 familiar of any comprehensive studies just offhand that  
20 you'd say: There is the current state-of-the-art that  
21 the Canadian Forestry Service has done with respect to  
22 this issue?

23 A. There are -- as you're aware, the  
24 major ongoing study at the moment is the study being  
25 done here in Thunder Bay District; that is, at least in

1 part funded by COFIDA, which would be federal forestry  
2 funding.

3 Q. In your career, can you tell me what  
4 predictive environmental impact tools you have  
5 developed?

6 A. That's a very broad question, Mr.  
7 Hanna. I'm not sure that I would say I have -- what I  
8 would say I have done in my career is put into place a  
9 number of scientific studies, in that they demonstrate  
10 the changes or the consequences of pesticide  
11 applications on organisms, perhaps give other people  
12 data on which they may base predictive and, in part,  
13 base predictive statements.

14 So I wouldn't say that I have put  
15 predictive tools in place in any way or fashion.

16 Q. Would it be fair to say that the  
17 great majority of the work that you have published on  
18 and have been involved in deals with monitoring rather  
19 than prediction?

20 A. I wouldn't say exclusively. We have  
21 done a number of things and, of course, I sometimes  
22 have some difficulty disassociating the work I've done  
23 with the work that's done with a group under -- with  
24 which I was associated, which includes others.

25 Quite a number of things to look at. The

1 types of responses animal communities might have to  
2 various levels of direct and indirect effects due to  
3 pesticides. I would, however, state that neither I or  
4 my group have done anything along that lines with  
5 respect to ungulates.

6 THE CHAIRMAN: Mr. Hanna, what are you  
7 looking for? Are you looking for a computer model?  
8 What kind of predictive tool are you looking for? In  
9 other words, it's a very broad term, what exactly are  
10 you seeking?

11 I mean, obviously things like guidelines  
12 can be used as tools, things like scientific studies  
13 can be used as tools, things like the expertise of  
14 various personnel, whether they be wildlife biologists  
15 or toxicologists, et cetera, can be used to assist in  
16 making the decisions as to when and if you use a  
17 pesticide, what the effect may or may not be on any  
18 particular specie of wildlife or wildlife collectively  
19 or fisheries or anything else. But what exactly are  
20 you seeking?

21 MR. HANNA: I would submit to you, Mr.  
22 Chairman, that an example of a model with respect to  
23 some of the work that Dr. Ritter described would be a  
24 dose response model. There is a classic prediction  
25 type tool. You give this dose, here is the response,



1       you can anticipate in terms of organism.

2                   MS. MURPHY: Well, you are going to have  
3       to ask Dr. Ritter. Actually he can take the stand  
4       again and provide a better understanding.

5                   MR. HANNA: I don't want Dr. Ritter to  
6       have to come back up.

7                   THE CHAIRMAN: But the point is, is that  
8       we have to clarify what you are asking for so that this  
9       witness can give you an answer that will benefit both  
10      your line of inquiry and will benefit the Board.

11                   I think we are spinning our wheels in  
12      talking with broad, generic terms which have no focus.

13                   MR. HANNA: Well, Dr. Ritter is back so  
14      I'll put the question to him.

15                   Q. Dr. Ritter, in the work that you're  
16      involved in in terms of looking at variable dosages of  
17      different chemicals on organisms, it's commonly  
18      developed what is called a dose response function; is  
19      that correct?

20                   DR. RITTER: A. That's correct.

21                   Q. And can that dose response function  
22      be used to predict how a particular organism will  
23      respond to a particular dose of a particular chemical?

24                   A. No. The purpose of the dose response  
25      relationship in biology, Mr. Hanna, is to establish

1       that with an increase in dose there is an increase in  
2       effect. That's the biological phenomenon to which I  
3       was referring.

4               So that from an experimental point of  
5       view, if a study does not satisfy that criteria, one  
6       might ask as to the biological significance of the  
7       result, but there are other ways in which we relate the  
8       dose used in an experimental study to the relevance to  
9       man or, in the case of animals -- I shouldn't really  
10      comment on the case of animals that you're referring to  
11      because I don't know.

12             But in the case of estimating risk to  
13      man, there are models of extrapolation, a substantial  
14      number of which I've elaborated on during the course of  
15      the last two weeks, to help us understand the  
16      relationship between the dose used in animals and the  
17      dose to which man may be expressed.

18             The dose response relationship does not  
19      speak to that issue, it speaks to the fidelity of  
20      biology. As one increases a dose, there should be a  
21      concomitant increase in effect and it's a measure of  
22      the truth in the experiment, if you like.

23             Q. It's a cause/effect?

24             A. That's right.

25             Q. Okay. Now, you talk about something

1       else other than dose response - I don't want to get  
2       into semantics because I may use it in a different way  
3       than you are - what was the other thing that you use to  
4       predict the impacts of dose -- different doses on  
5       organisms, people in your case?

6                   A.   It depends on the end point that  
7       you're referring to.  If we're talking about cancer,  
8       there are two conventions that are used; one is a  
9       margin of safety approach, and it's not the more  
10      popular convention, the other are a number of  
11      mathematical models that extrapolate from the dose used  
12      experimentally to the dose to which man might be  
13      exposed.

14                   If one is talking about teratology, there  
15      are a different set of principles that are in place,  
16      reproduction, so on and so forth.  So it's dependent  
17      very much on the end point under study.

18                   Q.   So each particular situation may have  
19      its own predictive tool depending on what it is we are  
20      looking at?

21                   A.   That's correct.  Predictive tool is  
22      not quite the way I would put it.  The way in which we  
23      extrapolate experimental results to man may be  
24      different for different end points.

25                   Q.   Fine.  So there's different

1 predictive ways to predict different end points, if you  
2 will?

3 A. I actually like my answer.

4 Q. Okay.

5 MR. HANNA: Mr. Chairman, I think that's  
6 what I'm getting at, what the witness has just said.  
7 This is the way that I take that information, the  
8 clinical studies that Dr. Ritter has described, and I  
9 then put that in a way in which I can interpret it in  
10 arriving at a decision.

11 THE CHAIRMAN: But is not that done in  
12 the normal course of wildlife management?

13 MR. HANNA: Well, I guess the question  
14 becomes very much one -- and maybe I would put this to  
15 Dr. Ritter.

16 Q. In arriving at those conclusions at  
17 the end points, do you generally try to make it  
18 explicit and consistent and as standardized as  
19 possible, or do you usually leave it to professional  
20 judgment?

21 DR. RITTER: A. Are you implying that  
22 the two are not consistent, that professional judgment  
23 is not --

24 Q. No, it's the question of being  
25 implicit versus explicit, I think is the -- there is



1 professional judgment always involved in these things -  
2 I'm not suggesting we can move away from professional  
3 judgment - it's a matter of how we incorporate that  
4 professional judgment in the process.

5 Is not the reason you develop, how do you  
6 say, standard protocols and procedures to provide, if  
7 you will, a structure within that professional judgment  
8 to be applied?

9 A. Yes. There are conventional  
10 protocols that one follows and conventional techniques  
11 that one uses to estimate potential human risk as a  
12 function of study results.

13 Q. Right. And that's why you have your  
14 margin of error type of procedure with very strict type  
15 of safety factors that you use to assist the - how do  
16 you say - the expert who is applying his professional  
17 judgment in making those sort of decision and then he  
18 puts that into a consistent framework that then leads  
19 to an end point, if you will?

20 A. Yes.

21 Q. Okay. Now, I will take it back to  
22 the biology side, and I am asking now, Mr. Kingsbury,  
23 what comparable type of system is in place to take the  
24 imperical evidence, which I would submit is comparable  
25 to laboratory-type evidence that we have on the human

1 toxicology side, to arrive at those conclusions?

2 A. I'm sorry to jump in ahead of Mr.  
3 Kingsbury. There's a subtlety that I don't know if it  
4 became immediately apparent to you or not.

5 Because we're dealing, in the case of  
6 public health hazards, with estimating risks for humans  
7 out of necessity, the trials are not done in humans.  
8 That's the essential principle of a margin of safety.  
9 We're attempting to bridge the gap between the  
10 experimental animal and the human.

11 In those cases where we have human data;  
12 that is, where the test species is the target species,  
13 it really eliminates that element of doubt. You no  
14 longer have to model and account for possible  
15 differences in sensitivity between the two because the  
16 two are the same.

17 Q. But if I want to do a risk analysis  
18 of a specific, say, hazardous waste treatment facility,  
19 and I wanted to determine what the potential  
20 consequences would be, I would take that imperical  
21 evidence, look at exposure rates, accepted population  
22 components, a whole variety of factors and put that  
23 into, if you will, a predictive type of procedure, say:  
24 This is the cancer rate I expect as a result of that  
25 particular proposition?

1                   A. If you didn't have direct human  
2 evidence, that's correct. But where we have direct  
3 human evidence the use of models becomes somewhat  
4 redundant.

5                   Q. But we can't have direct human  
6 evidence, it's something we haven't built yet?

7                   A. That's right.

8                   Q. An environmental assessment is, I  
9 would submit to you, is the process of deciding whether  
10 or not we are going to build something or do something.  
11 So, therefore, we --

12                  THE CHAIRMAN: Hold on, hold on. We are  
13 getting back to the environmental assessment aspect as  
14 to what environmental assessment means and we are  
15 dealing again, Mr. Hanna, with a process definition in  
16 a statute, requirements of a statute, and I think what  
17 Dr. Ritter has indicated does not have to do with that.

18                  I think what Dr. Ritter is alluding to,  
19 and I think Mr. Kingsbury also dealt with it in his  
20 direct evidence, was the fact that the effects of  
21 pesticides on animals is perhaps better known than the  
22 effects might be on humans, because most of the studies  
23 have in fact been conducted for both the possible human  
24 effect and the direct animal effect on animals.

25                  Is that correct, Dr. Ritter?

1 DR. RITTER: That's exactly the point.  
2 If you want to assess the effect in song birds, as Mr.  
3 Kingsbury noted yesterday, one counts dead song birds.

4 There is very direct evidence from the  
5 target species, but if we want to assess a potential of  
6 a chemical to induce cancer in man, we don't wait for  
7 it to induce cancer in man to assess that potential.  
8 So that we're, if you like, we're at somewhat of a loss  
9 compared to our environmental colleagues because they  
10 have the ability to test the target organism for the  
11 effect.

12 MR. KINGSBURY: If I might just add to  
13 what you said, Mr. Chairman, I would also suggest that  
14 the direct effects of the herbicide on the habitat can  
15 also be imperically measured. Okay.

16 Our ability to convert an imperical  
17 measurement of the habitat qualities through the  
18 response of animal communities to those imperical  
19 quantities the habitat provides, is perhaps the area  
20 where we are into more of a situation where it is more  
21 difficult to make -- you can make measurments, but  
22 sometimes it's more difficult in that area to say: The  
23 number of moose increased in this area because we  
24 produced "x" number of grams of -- or a browse of a  
25 certain type versus something else that happened.



1 I think perhaps that is the area where we  
2 are into limitations on our predictive capabilities.

3 THE CHAIRMAN: But, Mr. Kingsbury, is it  
4 a fact that once you know the impact of a particular  
5 pesticide, either directly on the wildlife population  
6 or indirectly in terms of the impact on habitat--

7 MR. KINGSBURY: Yes.

8 THE CHAIRMAN: --that there is no sort of  
9 model you can use or computerized model that you could  
10 construct to predict specifically what will happen to a  
11 given specie within a certain area?

12 MR. KINGSBURY: Basically what you would  
13 require at that point is a habitat organism model.

14 THE CHAIRMAN: For a particular specie?

15 MR. KINGSBURY: For a particular species,  
16 yes.

17 THE CHAIRMAN: But is not that habitat  
18 requirement side of it done by the wildlife managers--

19 MR. KINGSBURY: Absolutely.

20 THE CHAIRMAN: --of both the Ministry and  
21 other agencies?

22 MR. KINGSBURY: Absolutely, and it would  
23 be inappropriate for the federal process, as a for  
24 instance, to be the agency doing that.

25 THE CHAIRMAN: Okay. And isn't it just a

1 melding of the two things; in other words, you have the  
2 impacts from the pesticides, direct and indirect, and  
3 you have the requirement side for the wildlife species  
4 involved, and in determining whether or not you are  
5 going to use the pesticide and in what quantities and  
6 where in terms of area--

7 MR. KINGSBURY: That's correct.

8 THE CHAIRMAN: --you decide on what the  
9 requirements of whatever you are trying to protect are  
10 and make that decision? Is that the model, if you want  
11 to call it, that would be applied?

12 MR. KINGSBURY: That's correct. The main  
13 difference, when we speak to something like ungulates  
14 is: There is probably a great need for information on  
15 the context in which those habitat changes occur; i.e.,  
16 surrounding habitat qualities, as opposed to when we  
17 are talking about something like direct effects, you go  
18 on the assumption that direct effects only occur where  
19 the material is applied. So you're dealing with a  
20 smaller system.

21 THE CHAIRMAN: And does that get us into  
22 that whole area of testimony and evidence that we heard  
23 in terms of designing requirements for target species?

24 MR. KINGSBURY: Yes.

25 THE CHAIRMAN: In other words, you look

1 at the habitat requirements for certain target species  
2 and that will cover "x" percentage number of other  
3 species? You don't design for the habitat for every  
4 single specie that's out there?

5 MR. KINGSBURY: That is certainly one  
6 approach and I would suggest an appropriate --

7 THE CHAIRMAN: Is that not the approach  
8 done by the Ministry?

9 MR. KINGSBURY: Yes.

10 MR. HANNA: We're talking target species.

11 Q. Mr. Kingsbury, you are talking about  
12 featured species?

13 THE CHAIRMAN: Sorry, featured species.  
14 I guess that was the term that was used.

15 MR. HANNA: Q. Is that what we're  
16 referring to, Mr. Kingsbury?

17 MR. KINGSBURY: A. I believe that's what  
18 the Chairman was referring to, yes.

19 Q. I meant in your evidence, that's what  
20 I was...

21 MS. MURPHY: He didn't give evidence  
22 about featured species.

23 MR. HANNA: Oh, I'm sorry.

24 THE CHAIRMAN: No, I am not suggesting he  
25 did.

1 MR. HANNA: Okay.

2 THE CHAIRMAN: I am just suggesting that  
3 we've heard a lot of testimony about feature species  
4 and how habitat requirements for featured species  
5 cover, in effect, in the view of the Ministry, a number  
6 of other species that would be affected in a similar  
7 way.

8 MR. HANNA: Q. Back to page 42, just to  
9 clarify. That linkage 5 that we've been dwelling on  
10 here, incorporates then both this effect on the habitat  
11 and then the habitat linkage with the population, be it  
12 a featured species or some other species. That's  
13 what's incapsulated in linkage 5?

14 MR. KINGSBURY: A. It says it takes  
15 place by two separate steps. Perhaps it would be more  
16 appropriate to give them different numbers because, as  
17 I've indicated, they rely on totally different  
18 databases.

19 Q. Okay. Can we turn to page 67. This  
20 is the section of the report dealing with Link 5.

21 A. Yes.

22 Q. Before I go through this, I'd just  
23 like to confirm, you are in complete agreement with  
24 what is stated in this section of the report dealing  
25 with Link 5?



1                   A. In my direct evidence I summarized  
2 and made comments on the conclusions, and one of the  
3 things that I said -- dealing first of all with  
4 conclusion No. 1.

5                   Sorry, one of the things I said in  
6 addressing conclusion No. 1, which is that herbicide  
7 use will change the vegetation present in the treated  
8 area and modify the rates of forest succession, was I  
9 indicated that it is my conclusion that this will occur  
10 in ways that can be similar to other tending practices  
11 and that it changes on sites where previous timber  
12 management activities have already dramatically altered  
13 the vegetation in the recent past.

14                  I emphasize the importance of considering  
15 those things.

16                  Q. Are there any other clarifications in  
17 that section that I should be aware of?

18                  A. I believe that in my direct  
19 evidence -- and perhaps I should be going back to the  
20 transcript.

21                  MS. MURPHY: The page in the transcript  
22 where Mr. Kingsbury discussed these pages, it commences  
23 at page 20262 in the transcript.

24                  MR. HANNA: Mr. Chairman, I would suggest  
25 that I review that at the next break and continue on at

1       that point, rather than have the witness go through it  
2       at this time.

3                   THE CHAIRMAN:   Very well.

4                   MR. HANNA:   Q.   In the first paragraph on  
5       page 67 under Conclusions, there is a statement there  
6       indicating that the impact of insecticides and their  
7       indirect effect on habitat is outside the scope of  
8       these discussions.   Do you see that?   It starts:

9                   "It is worth noting in passing..."

10                  The second sentence under Conclusions.

11                  MR. KINGSBURY:   A.   What it says there:

12                  "It is worth noting in passing that not  
13       using insecticides may lead to important  
14       changes in habitat."

15                  What it's suggesting there is that if an  
16       option of not using pesticides is chosen, the habitat  
17       may be modified by the action of the pest.

18                  Q.   Right, yes.

19                  A.   And it's saying that that aspect is  
20       not discussed in this ESSA Document.   It can in fact be  
21       a very dramatic impact in some localized situations or  
22       fairly significant areas.

23                  Q.   Have you dealt with this elsewhere in  
24       your evidence.

25                  MS. MURPHY:   The evidence of this panel

1 has earlier discussed the history of impacts of  
2 insects, history of infestation, the size of it, the  
3 scope of it, where it has been, so on and so forth.

4 This is not Mr. Kingsbury's evidence nor  
5 is it, as they are pointing out, the subject of this  
6 document.

7 MR. HANNA: Mr. Chairman, I was not  
8 asking the witness about what insect infestations  
9 occurred in the province, I was asking the witness  
10 whether the consequences of that as, if you will, an  
11 alternative to using insecticides, whether that has  
12 been considered, the effects of that -- the  
13 environmental effects within the scope of his evidence,  
14 has been dealt with elsewhere in his testimony.

15 I'm not aware of anyone else on the panel  
16 that has dealt with that in terms of terrestrial and  
17 aquatic organisms.

18 THE CHAIRMAN: Well, on this panel, as I  
19 understand it, we are essentially exploring what  
20 happens if you use them -- if you use pesticides,  
21 either herbicides or insecticides, and what are the  
22 impacts from that. If you don't use them, there is  
23 another possible set of impacts.

24 MR. HANNA: Correct.

25 THE CHAIRMAN: Pardon?

1 MR. HANNA: Correct. Yes, I agree.

2 THE CHAIRMAN: But that is not the  
3 concern of this particular panel. We have had other  
4 panels that have dealt with the situation where  
5 infestation, for example, by spruce budworm in various  
6 areas defoliates and affects habitat obviously of  
7 wildlife and other organisms. But that's dealt with  
8 elsewhere. I think the --

9 MR. HANNA: I will have to go back and  
10 review the evidence, Mr. Chairman. I'm not familiar  
11 with that at the present time.

12 MR. KINGSBURY: Mr. Hanna, I have made  
13 reference to the effects of not using pesticides in a  
14 very general way and have given a couple of occasions  
15 simply to indicate that it's one of the possible ways  
16 in which effects through making decisions about  
17 pesticides could occur.

18 THE CHAIRMAN: Plus, Mr. Hanna, my  
19 colleague points out that some of this evidence was  
20 done -- sorry, was covered by other members of Panel  
21 13, such as Mr. Churcher and Mr. Iskra.

22 MS. MURPHY: Mr. Galloway.

23 THE CHAIRMAN: Mr. Galloway, et cetera.  
24 It is not being handled, per se, by these two witnesses  
25 who are dealing specifically with insecticides and



1 herbicides and their effect if they are used. That's  
2 the way we understand it.

3 MR. HANNA: Yes, I appreciate that. I  
4 guess the point -- the only difference I was making  
5 there is, I understand they have talked about the  
6 potential for those outbreaks and if you don't protect  
7 the forest that they might occur.

8 I'm not familiar with anyone saying:  
9 Now, here are the consequences of that in terms of  
10 terrestrial and aquatic organisms.

11 THE CHAIRMAN: I guess I am having  
12 trouble with the who. I mean, these topics were dealt  
13 with by other witnesses on Panel 13.

14 MR. HANNA: Well, perhaps I --

15 THE CHAIRMAN: They have not been dealt  
16 with by Mr. Kingsbury or Dr. Ritter but that, to our  
17 understanding, was not the purpose for which they were  
18 called.

19 MR. HANNA: Q. Mr. Kingsbury, can we  
20 deal with Conclusion No. 1?

21 MR. KINGSBURY: A. Yes.

22 Q. And I'd particularly like to deal  
23 with the last sentence where it says:

24 "These changes are certain to have some  
25 habitat effects on a local scale and for

1 a period of a few years."

2 A. Yes.

3 Q. What do you mean by local scale in  
4 that context?

5 A. On a local scale, what it's saying is  
6 that by and large the changes in vegetation will be  
7 restricted to within the boundaries of the treated  
8 areas.

9 Q. Would you not agree that the  
10 consequences in terms of wildlife could go far beyond  
11 the treated area?

12 A. I would agree if in fact the wildlife  
13 has a normal range, including the treated area, and if  
14 some value within the treated area was critical to that  
15 wildlife species and it was altered in such a way that  
16 a critical aspect of the habitat requirements of that  
17 species was removed and the removal of that led to  
18 inability of that wildlife species to maintain itself.

19 That is sort of like saying that,  
20 depending on the species you are dealing with, that the  
21 fact that it's removed from an area affects in the  
22 future its occurrence anywhere else.

23 I guess, if you want to take that  
24 specific type of interpretation, you can say that, you  
25 know, the effects are on a local scale.

1                   For instance, if song birds are killed by  
2                   a pesticide spray in Central America it may reduce  
3                   their occurrence in the boreal forest in the summer and  
4                   you can say, in that context, that it's not just a  
5                   local scale.

6                   I guess if you want to take that kind of  
7                   an approach to it you could say: Well, it isn't always  
8                   a local scale, but I'm not sure that that really  
9                   enlightens us in any way.

10                  MRS. KOVEN: Hasn't your evidence been,  
11                  Mr. Kingsbury, that the spray areas are in fact  
12                  relatively small in size and dispersed; they are not --

13                  MR. KINGSBURY: Dr. Campbell presented  
14                  that--

15                  MRS. KOVEN: That is Dr. Campbell's  
16                  evidence.

17                  MR. KINGSBURY: --that kind of evidence  
18                  in some detail with some specific examples.

19                  MRS. KOVEN: Mm-hmm. And isn't that  
20                  compatible with your idea of local scale?

21                  MR. KINGSBURY: Absolutely.

22                  THE CHAIRMAN: And wouldn't the wildlife  
23                  manager take into account the habits or the habitat  
24                  requirements of a particular specie including, a range  
25                  if necessary?

1 MR. KINGSBURY: Yes.

2 MR. HANNA: Q. Mr. Kingsbury, is it not  
3 true that 35 per cent of the area harvested annually in  
4 the province is currently treated with herbicides?

5 MR. KINGSBURY: A. I believe that's the  
6 figure that Dr. Campbell's direct testimony contains.

7 Q. Is it not true that the vast majority  
8 of productive -- excuse me. Is it not true that the  
9 vast majority of productive forest in Ontario is slated  
10 for harvesting?

11 MS. CRONK: Sorry, sir. This witness  
12 can't answer that.

13 MR. HANNA: Well, Mr. Chairman, I would  
14 say to you that if he is making this proposition that  
15 it's local in scale he must have some knowledge...

16 THE CHAIRMAN: No, no, no. Mr. Hanna,  
17 this witness is not an expert in connection with either  
18 wood supply or scale of harvesting as contemplated by  
19 the Ministry or anything like that. He is not  
20 qualified to answer that question.

21 MR. HANNA: Well, in the document that  
22 he's responding to -- that he is responsible for, it  
23 indicates that 35 per cent of the area harvested which  
24 comprises 200,000 hectares annually is treated with  
25 herbicides. So he obviously has some knowledge of the



1 area harvested.

2 MS. MURPHY: The direct evidence on this  
3 was put in by Dr. Campbell in a great deal of detail,  
4 he was cross-examined and that's the evidence on that  
5 matter.

6 MR. HANNA: Mr. Chairman, I'm reading  
7 directly from the report that this witness is  
8 responding to. I'm looking at page 11 on the report at  
9 the bottom of the page.

10 MS. CRONK: And that is why I didn't  
11 object to the first question because we knew that was  
12 there.

13 My only point is, you have received  
14 evidence from those qualified to give it on the extent  
15 of productive forest lands scheduled for harvesting  
16 and, in the circumstances, this witness should not, in  
17 any event, be examined on an area that is already  
18 covered but, secondly, an area that has nothing to do  
19 with the evidence he's intending to give.

20 MR. HANNA: I would submit to you, Mr.  
21 Chairman, that it has everything to do with the  
22 evidence this witness is giving. He is indicating to  
23 us that the herbicides impacts are local in scale and  
24 I would submit to you that 35 per cent of the area  
25 annually harvested is being treated with herbicides.

1                   That is an extensive part of the province  
2                   being annually -- or being ultimately harvested.

3                   MS. MURPHY:   Sorry, there's a problem.  
4                   It's the second part of it that is the problem.

5                   MR. HANNA:   Well, this witness is saying  
6                   they are local in scale.

7                   THE CHAIRMAN:   And he has indicated to  
8                   you what he means by local in scale.

9                   MS. MURPHY:   There is no problem with the  
10                  assertion, it's here, it has been made before that  
11                  approximately one third of the area harvested each year  
12                  is treated with herbicides.

13                  The next question or next statement that  
14                  was put to the witness had something to do with all of  
15                  the productive forest and some schedule.   I don't know  
16                  where that comes from, neither does the witness, and  
17                  Mr. Hanna hasn't told him.

18                  It is that part of it that we have a  
19                  problem with.

20                  THE CHAIRMAN:   Plus I don't think this  
21                  witness--

22                  MS. MURPHY:   If he's even qualified to...

23                  THE CHAIRMAN:   --would be qualified to  
24                  answer that anyways.

25                  MR. HANNA:   Q.   If the great majority of

1 productive forest in Ontario was slated for harvesting,  
2 would it not follow that nearly 35 per cent of the area  
3 of the province will be treated ultimately with  
4 herbicide at least once over the next rotation and some  
5 sites will be repeatedly treated?

6 THE CHAIRMAN: Ms. Cronk?

7 MS. CRONK: Sir, to the Board generally  
8 and through you, sir, to Mr. Hanna, that the use of  
9 hypothetical questions is appropriate to an expert  
10 witness to elicit opinion evidence on matters in which  
11 he--

12 THE CHAIRMAN: Within his expertise.

13 MS. CRONK: --and he can answer. So that  
14 you can't solve the problem by converting the question  
15 into a hypothetical in this instance.

16 THE CHAIRMAN: Mr. Hanna, we will have to  
17 direct you to move on in terms of that point or that  
18 question, because this witness is clearly not qualified  
19 to give opinion evidence on those matters.

20 MR. HANNA: Q. Mr. Kingsbury, is it your  
21 view that in the order of 60,000 hectares annually  
22 treated with herbicide is a small scale?

23 MR. KINGSBURY: A. Mr. Hanna, when I  
24 made reference when we talked about local scale, what I  
25 am saying is that if you apply a pesticide -- a

1 herbicide in one place, the effects of that, the use of  
2 that herbicide application are localized.

3 Now, I believe that one of the intentions  
4 of having this conclusion is to go on to say, in the  
5 second conclusion, that the effects that are possible  
6 through the application of that herbicide are likely to  
7 be exerted more strongly on species that are smaller  
8 and shorter lived and less mobile and, therefore, have  
9 less utilization of a larger area of habitat which  
10 would encompass a portion of the habitat not modified  
11 by the herbicide application.

12 I'm not sure that implicit in that is any  
13 kind of attempt to deal with the actual acreage of use  
14 in the province.

15 Q. How did you arrive at the conclusion  
16 that the impacts of herbicide application will last  
17 only a few -- a period of a few years?

18 A. We are back to conclusion 1?

19 Q. Yes.

20 A. And we are talking about changes in  
21 the vegetation present. We are saying that these  
22 changes will have habitat effects for periods of a few  
23 years and I suspect that really what's important there  
24 is the realization that a herbicide is going to alter  
25 the rate of plant succession on a site.



1                   It is not going to stop plant succession  
2                   from occurring, it will basically give it a different  
3                   starting point and perhaps have some influence through  
4                   its selective effects on different plant species, sort  
5                   of start that community off with a different structure  
6                   and composition.

7                   Q.   Which can be a very long-term  
8                   consequence?

9                   A.   If the herbicide is effective for its  
10                  intended use, as a for instance, in that it returns the  
11                  forest to a mature conifer forest more rapidly or more  
12                  completely, yes, you could say that the vegetation on  
13                  that site is modified for the length of the rotation  
14                  just as the fact that the site was previously harvested  
15                  is going to change that site for a long period of time.

16                  THE CHAIRMAN:   But are not those effects  
17                  intended?

18                  MR. KINGSBURY:   Those are intended  
19                  effects.

20                  THE CHAIRMAN:   In other words, if you use  
21                  a herbicide for a particular purpose, you are  
22                  deliberately planning to change that vegetation in a  
23                  way that you know the herbicide will affect it; is that  
24                  not right?

25                  MR. KINGSBURY:   That's correct.

1 MR. HANNA: Q. And the consequences of  
2 those plans are long term?

3 MR. KINGSBURY: A. I would agree with  
4 that, Mr. Hanna.

5 Q. There was one key word in your  
6 previous response that caught my attention and that is,  
7 "return it to mature conifer forest." Can herbicides  
8 not be used for stand conversion; in other words,  
9 taking what was previously a deciduous forest and  
10 converting it into a mature conifer forest?

11 A. That could be one situation in which  
12 you might utilize herbicides as one of your management  
13 techniques.

14 Q. So...

15 A. I guess -- Mr. Hanna, I don't want to  
16 leave the impression that this conclusion is in any way  
17 intended to say that herbicides will not affect the  
18 status quo. The forest is a dynamic system, there is  
19 always changes occurring. The use of the herbicide  
20 simply has an influence in affecting rate or nature of  
21 the changes that take place.

22 Q. And that is what is meant by Link 5,  
23 that it will change the habitat and, therefore, change  
24 the distribution, abundance of wildlife?

25 A. Well, that is the second step in

1 change 5 is that wildlife will respond to the  
2 changes -- potentially can respond to the changes in  
3 habitat.

4 Q. And you are saying those are the  
5 effects -- that was the hypothesis. That is the effect  
6 of herbicide applications in Link 5?

7 A. Yes.

8 Q. How many years is a cut-over not  
9 treated with herbicide optimal for moose browse?

10 A. You can appreciate that that is  
11 highly dependent upon the nature of the site, the plant  
12 species growing on it, the rate of growth, a whole  
13 number of factors. There is some -- there have been  
14 studies done, and perhaps we would be on more solid  
15 grounds dealing with specific studies if you want me to  
16 actually give you periods of time.

17 Q. Your choice.

18 THE CHAIRMAN: No. But, Mr. Hanna, the  
19 point is, there are no studies that are sort of before  
20 us on that point right now that have been introduced.

21 What I think Mr. Kingsbury is saying,  
22 it's a site-specific matter and if you want to deal by  
23 way of example, deal with it by way of a site-specific  
24 example.

25 Is that what your position is, Mr.

1 Kingsbury?

2 MR. KINGSBURY: That's correct. And I  
3 would suggest that, to a certain extent, some of that  
4 data is available in Exhibit 722 which Ms. Cronk  
5 submitted to the Board.

6 MR. HANNA: Q. Again, I'm coming back to  
7 this conclusion of a few years. You are coming to that  
8 conclusion of a few years. Implicit in that is some  
9 assumption as to how long the site would have been at  
10 an optimal stage or suitable stage as far as moose  
11 browse would be with and without herbicide application.

12 Am I incorrect there, have I missed  
13 something?

14 MS. MURPHY: Well, you have missed it.  
15 It doesn't say anything in here about moose browse.

16 MR. HANNA: Q. Well, shall we go  
17 through, Mr. Kingsbury, that altered succession in Link  
18 5 includes moose browse?

19 MR. KINGSBURY: A. Certainly altered  
20 succession has a major effect -- potentially has a  
21 major effect on moose browse that is present on a site  
22 at different time periods before or after the use of  
23 the herbicide.

24 Q. So to come to this conclusion of a  
25 few years, back to that issue, you have to have some



1 concept of how long the site will be suitable for moose  
2 browse with or without herbicide treatment?

3 A. Perhaps it would help if I indicated  
4 to you my understanding of how a herbicide application  
5 can modify moose browse on a site. Would that be of  
6 assistance?

7 Q. No. Perhaps I will ask you another  
8 question and maybe it will get us moving on faster  
9 here.

10 If an area is treated with herbicide, and  
11 I'm particularly dealing here with glyphosate, how long  
12 would you expect the effects to be felt?

13 A. The effects on the plant community  
14 and its succession?

15 Q. Let's just try and narrow this right  
16 down and just talk about moose browse. There's a whole  
17 bunch of other thing...

18 A. Moose browse?

19 Q. Yes.

20 A. The initial effects would potentially  
21 fall in the area, the glyphosate could kill plant  
22 species and, of course, you know, starting point is:  
23 What is the moose browse on the site at the time.

24 Q. Can I just maybe just read the  
25 question again. I think the answer isn't right on to

1       what I'm asking.

2                       The question is: How long would you  
3       expect, not what the effects are, but how long would  
4       you expect...

5                       THE CHAIRMAN: But he can't tell you how  
6       long unless he knows what plants are going to be  
7       affected by the glyphosate and to know that you have to  
8       know what is on the site.

9                       I take it it's not just the same amount  
10      of time, Mr. Kingsbury, for all species of plant that  
11      are treated by glyphosate?

12                      MR. KINGSBURY: That's right. Perhaps I  
13      will give you a specific answer, Mr. Hanna. I'm aware  
14      of a study that says that nine or more years after an  
15      application of glyphosate there was more moose browse  
16      available on a site treated with the material than  
17      there was on a control site, and that would suggest  
18      that the effects, in this case an enhancement of the  
19      amount available, nine years after treatment were still  
20      being expressed.

21                      MR. HANNA: Q. So you are suggesting  
22      nine years is a few years?

23                      MR. KINGSBURY: A. I'm saying that I'm  
24      citing imperical data that suggests...

25                      Q. Well, I'm trying to get a handle on

1        what this few years means, that is what my question,  
2        that's why I'm asking these questions.

3                    What's your interpretation of a few? Are  
4        we talking about rotation, half a rotation, are we  
5        talking about two years, one year. I'm trying to get  
6        some handle on what you mean by a few years.

7                    A. The effects of the herbicide  
8        treatment on moose browse will last for as long as the  
9        herbicide treatment has either removed or indirectly,  
10      by the subsequent changes in plant succession, put in  
11      place species that are suitable and within browsing  
12      height of moose.

13                   And I have data here that suggests that  
14      that can be -- occur for at least nine years in one  
15      study on one site.

16                   Q. And that being the case, you are  
17      saying it's positive?

18                   A. It's suggesting that at the nine  
19      years after treatment, it was positive. But I would  
20      also recognize that it's a dynamic thing, that there is  
21      other data in place that would suggest that earlier in  
22      the cycle of plant succession that has been influenced  
23      by the herbicide, it may have in fact been negative in  
24      terms of reducing at some point the amount of browse  
25      available, and there is data that would suggest that,

1 and common sense will tell you that if the herbicide is  
2 effective, at some point there will be less browse  
3 available.

4 Q. And that is in fact in your evidence;  
5 is it not, on page 73 in the third paragraph where you  
6 have got contradicting results in the report?

7 MR. CRONK: Well, that is not what he  
8 said, Mr. Chairman. I am sorry, that is not what the  
9 witness said.

10 MR. KINGSBURY: Can you restate the  
11 question to me, Mr. Hanna, and make reference to the  
12 specific...

13 MR. HANNA: Q. I'm looking at the third  
14 paragraph on page 73 of Exhibit 604C?

15 MR. KINGSBURY: A. Yes.

16 Q. I'm reading here directly from a  
17 report where it says:

18 "In reference to a study by Kennedy,  
19 1986..."

20 A. Yes.

21 Q. That:

22 "With glyphosate treatments, browse  
23 production remained low for five to ten  
24 years."

25 A. He does not say that. He says he's



1 speculated -- he says that:

2 "Kennedy concluded glyphosate reduced  
3 summer browse..."

4 And I'm not sure whether -- when that  
5 data measurement was made, and he speculated:

6 "Amounts of browse production would  
7 remain low for five to ten years."

8 I suggest the word speculated is  
9 important there. I have also suggested there is  
10 imperical data in 722 that said nine years after a  
11 glyphosate treatment, a measurement of moose browse  
12 available on a glyphosate-treated site and on untreated  
13 site suggests that there was in fact enhancement of the  
14 levels available on the glyphosate-treated site nine  
15 years after than there was on the control site.

16 Q. So you are saying you disagree with  
17 Mr. Kennedy's speculation?

18 A. I'm saying that there is imperical  
19 data that on another site nine years after a glyphosate  
20 treatment moose browse did not appear to be at a low  
21 level.

22 Q. But I'm asking for your opinion. Do  
23 you agree or disagree with Mr. Kennedy?

24 A. I would have to know the nature of  
25 the site that Mr. Kennedy -- I mean, in all fairness,

1 I'm not going to say that what happened on another site  
2 in a different place suggests that it would  
3 automatically happen on the site that Mr. Kennedy did  
4 his studies. I am not sure what the nature of his  
5 speculation -- what his speculation was based on,  
6 whether it was a total removal of the plant species and  
7 sources of recruitment of plant species of potential  
8 use to moose.

9 I would suggest that from my own  
10 experience on most, if not all, forest sites where  
11 there is a removal of vegetation, there will be a  
12 subsequent reinvasion of the site by vegetation that  
13 may or may not have -- provide, somewhere down the  
14 line, more or less values in terms of moose browse.

15 THE CHAIRMAN: Could we use some ballpark  
16 figures then, just by way of speculation. Would you  
17 agree that the range might be between five and ten  
18 years after treatment you could go anywhere from  
19 recovery of the site to enhancement of the site based  
20 on the imperical study you referred to?

21 MR. KINGSBURY: Yes. And I suggest that  
22 the direct evidence of Dr. Campbell regarding the  
23 duration of the toxic effects of the herbicide on the  
24 vegetation on the site suggests that, in Ontario, in  
25 situations as few as two and certainly up to ten years

1 many herbicide-treated sites become rapidly revegetated  
2 with plant material that I suspect would offer  
3 reasonable moose browse.

4 THE CHAIRMAN: Okay. Using the range of  
5 two to ten years--

6 MR. KINGSBURY: Yes.

7 THE CHAIRMAN: --would you be prepared to  
8 concede that that is what you mean--

9 MR. KINGSBURY: Yes.

10 THE CHAIRMAN: --when you get that  
11 reference to a few years?

12 MR. KINGSBURY: Going back to the  
13 conclusion?

14 THE CHAIRMAN: Right.

15 MR. KINGSBURY: Conclusion 1.

16 MR. HANNA: Q. Notwithstanding what we  
17 have said before that the other consequences in terms  
18 of stand conversion may be there for a rotation or more  
19 of the forest?

20 MR. KINGSBURY: A. I guess one of the  
21 reasons that for periods of a few years is, in that  
22 conclusion - and, again, I indicated when I told you  
23 about this conclusion and my additional comments on  
24 it - was the recognition that this herbicide is applied  
25 to a site where there have been previous timber

1 management activities.

2 Those previous timber management  
3 activities, I believe you are suggesting, are going to  
4 affect that site for a long period of time, the fact  
5 that you harvested it is going to affect it for the  
6 length of a rotation.

7 What I'm suggesting is, the fact that you  
8 apply herbicide on that site which is in an early stage  
9 of revegetation is going to, for a short period of  
10 time, have a very dramatic effect on that early stage  
11 of revegetation and that that is again going to, if you  
12 want to say, perhaps go back to a different starting  
13 point in the stage of revegetation, and that once the  
14 direct toxic effects of the herbicide on plants on the  
15 site are no longer occurring, that the site is going to  
16 revegetate and -- that the nature of that revegetation:  
17 Well, sure it's going to be different for the rotation  
18 and the next rotation, et cetera.

19 Q. So what we have agreed to I think  
20 here is that we have got this short term, we have got  
21 those longer term consequences, it depends upon the  
22 site because of the species available, whatever,  
23 there's a whole variety of factors that come into bear  
24 in terms of determining what the consequences of  
25 herbicide application on any site will be?



1 MS. MURPHY: On moose browse.

2 MR. HANNA: On moose browse. Thank you,  
3 Ms. Murphy.

4 MR. KINGSBURY: Yes.

5 MR. HANNA: Q. You would agree with me  
6 also that there is a great deal of information that  
7 could be brought to bear in arriving, just with moose,  
8 a species we have relatively good information on--

9 A. Yes.

10 Q. --in arriving at what, in your  
11 hypothesis here, what might be the ultimate  
12 consequences of Link 5?

13 A. In terms of numbers of animals on the  
14 site.

15 Q. Distribution--

16 A. Yes.

17 Q. --of terrestrial organisms. Is it  
18 your view that models are an efficient and effective  
19 way to organize and manipulate large quantities of data  
20 and information?

21 A. Models are very useful for that and I  
22 would like to have a little more context I guess.

23 Q. I think the context I was saying, in  
24 this particular case, because we have got such a large  
25 amount of information and different factors taking

1 place, it lends itself to that type of tool.

2 MS. CRONK: I'm sorry, Mr. Chairman. In  
3 terms of what type of modeling are the questions being  
4 asked?

5 THE CHAIRMAN: Are we talking computer  
6 modeling, are we talking mathematical modeling, what  
7 kind of modeling?

8 MR. HANNA: Mathematical modeling.

9 Q. Fine, I'll go with mathematical  
10 modeling

11 MR. KINGSBURY: A. With specific  
12 reference to the area of habitat?

13 Q. Link 5.

14 A. Wildlife responses to habitat  
15 changes?

16 Q. Link five, yes.

17 A. I wouldn't pretend to be an expert on  
18 those models in that area. I suspect that there are  
19 many more wildlife managers that would know far more  
20 about that than I would.

21 THE CHAIRMAN: Mr. Kingsbury, with your  
22 limited knowledge on modeling--

23 MR. KINGSBURY: Yes.

24 THE CHAIRMAN: --that you have admitted  
25 to, I take it.

1 MR. KINGSBURY: Yes.

2 THE CHAIRMAN: Would you feel that it  
3 would be particularly helpful when so much of this is  
4 site-specific?

5 MR. KINGSBURY: I would suggest that my  
6 experience and the direct evidence of Dr. Campbell  
7 would suggest that there is considerable hazard in  
8 trying to simplify the first stage of plant community  
9 responses over time and that, of course, as that aspect  
10 of the model is weakened it has severe consequences in  
11 terms of later steps in the model.

12 MR. HANNA: Q. But there are ways to  
13 develop models that can use both generic and  
14 site-specific information in an efficient way?

15 MR. KINGSBURY: A. I wouldn't attempt to  
16 answer that question on the basis of my knowledge.

17 Q. Are you aware of other forest  
18 managers' opinions on the utility of models to deal  
19 with those -- this particular, this very specific issue  
20 we have just been going through, to arrive at  
21 site-specific decisions?

22 THE CHAIRMAN: Are you going to put to  
23 the witness a specific model that you have in mind and  
24 ask him to comment on it?

25 MR. HANNA: A specific opinion, yes, Mr.

1 Chairman.

2 THE CHAIRMAN: Okay. Why don't you do  
3 that and form your question in terms of what you are  
4 putting to him.

5 MR. HANNA: Q. Have you read the 1986  
6 paper written by Dean Gordon Baskerville on Cumulative  
7 and Environmental Impact Assessment?

8 MR. KINGSBURY: A. I'm not intimately  
9 acquainted with that paper, Mr. Hanna, to the extent  
10 that I could say I have read documents by Dean  
11 Baskerville and I couldn't even tell you whether that  
12 was one of the specific documents. It is certainly not  
13 an area that I would pretend to be able to represent  
14 what was said in that paper.

15 Q. So you are not aware that he talked  
16 there very specifically about herbicides and the  
17 cumulative impact of herbicides on the forest estate?

18 A. I know it's an area that Dean  
19 Baskerville has addressed questions of both pest and  
20 pest use implications on the nature of the  
21 modifications of the habitat.

22 Q. Would you view the application of  
23 herbicides to forests as a form of cumulative  
24 environmental impact?

25 THE CHAIRMAN: Well, I think the witness



1 has indicated that he's not familiar with the specific  
2 article that you are talking about.

3 MR. HANNA: I have moved away from it,  
4 Mr. Chairman.

5 THE CHAIRMAN: We have moved away. This  
6 is just a general question?

7 MR. HANNA: Yes.

8 THE CHAIRMAN: Well, I don't think his  
9 expertise is really in this area.

10 MS. MURPHY: How could one think he could  
11 get into it. (inaudible)

12 MR. HANNA: Well, Ms. Murphy and I can  
13 get into that discussion later. I don't think this is  
14 an appropriate time for that.

15 I think the witness could simply say, I  
16 have no knowledge of cumulative environmental effect  
17 assessment, and I think that can do it, Mr. Chairman.

18 THE CHAIRMAN: Do you want to say that,  
19 Mr. Kingsbury?

20 MR. KINGSBURY: Are you referring to  
21 cumulative environmental effects assessment as defined  
22 by Dean Baskerville in his document?

23 MR. HANNA: No, the Canadian  
24 Environmental Assessment Research Council, as defined  
25 by them.

1 MS. CRONK: All right. Sir, I'm sorry.  
2 There is a number of problems with this, as the Board  
3 will appreciate.

4 First of all, a term that appears to be a  
5 term of art has been put to the witness without  
6 identifying whose definition of that term of art is  
7 being used. It could be Dean Baskerville's, based on  
8 what you heard. We now know that it's the -- sorry?

9 MR. HANNA: Canadian Environmental  
10 Assessment Research Council.

11 MS. CRONK: Thank you. In either event,  
12 unless the witness is provided with what that  
13 definition is by the source Mr. Hanna relies upon in  
14 the question, in my submission, it is inappropriate and  
15 indeed unfair to the witness.

16 THE CHAIRMAN: Plus, he may not have the  
17 expertise in that area in any event, but let's find  
18 out.

19 He hasn't seen that definition. Are you  
20 familiar with the document that Mr. Hanna just referred  
21 to? I know you haven't seen it.

22 MR. KINGSBURY: No, I'm not familiar with  
23 this document.

24 MS. MURPHY: Neither am I.

25 MR. HANNA: I promise not to ask Ms.

1       Murphy any questions on it.

2                   Q.   Just to clear this off.  You have no  
3       knowledge of the literature and the nature of  
4       cumulative environmental impact assessment as used by  
5       the Canadian Environmental Assessment Research Council;  
6       is that correct?

7                   MR. KINGSBURY:  A.  It's hard to know  
8       that you have no knowledge of something, when I have no  
9       knowledge of how the Canadian Environmental Assessment  
10      process defines that body of knowledge.  I'm sorry, Mr.  
11      Hanna.

12                  MRS. KOVEN:  Excuse me, Mr. Hanna.  When  
13      was the Canadian Environmental Research Society formed?

14                  MR. HANNA:  It's the Research Council,  
15      Mrs. Koven.

16                  MRS. KOVEN:  Or council.

17                  MR. HANNA:  I believe that the actual  
18      council was formed - I'm going by memory - it would be  
19      in the early 80s, I believe.  It may have been in the  
20      late 70s, but it's in that time period.

21                  It's actually an offset of the Federal  
22      Environmental Assessment Review Office, FEARO, and it's  
23      sort of -- it's their research arm, if you will, and  
24      they had a whole series of publications on  
25      environmental impact assessments which deal with a

1       variety of subjects, cumulative environmental impacts  
2       being one of them.

3                   THE CHAIRMAN:  You must also appreciate  
4       that their process is quite different from the Ontario  
5       one?

6                   MR. HANNA:  I appreciate the process is  
7       very different, I'm not sure that the science of  
8       undertaking environmental impact prediction is  
9       different, but...

10                  MR. KINGSBURY:  Mr. Hanna, I am aware,  
11       now that you have linked the relationship of this  
12       research arm to the federal environmental assessment  
13       process, I am aware of the federal environmental  
14       process and some of its earlier publications which may  
15       in fact make me somewhat aware of the body of knowledge  
16       you are referring to.

17                  I'm not aware of that specific research  
18       arm or the publication that you are utilizing at the  
19       moment.

20                  MR. HANNA:  Q.  I would like to read you  
21       just one passage that's not -- it doesn't need be put  
22       in context because I think it's very self-evident what  
23       it's saying.

24                  THE CHAIRMAN:  Well, no, no, no.  I'm  
25       afraid...



1 MS. MURPHY: It does matter.

2 THE CHAIRMAN: You can't just read  
3 something out of context when the witness has already  
4 identified that he knows nothing of that publication  
5 nor of the body that put forward that definition.

6 MR. HANNA: Q. Mr. Kingsbury, you  
7 indicated that you are familiar with some of Dr.  
8 Baskerville's writings; is that correct?

9 MR. KINGSBURY: A. I indicated that I  
10 have heard and have read some of Dr. Baskerville's  
11 writings, but I would have trouble identifying the  
12 specific one that you made reference to.

13 Q. Do you agree with the emphasis Dean  
14 Baskerville places on the need to use explicit  
15 quantitative tools --

16 THE CHAIRMAN: Well, just a moment, Mr.  
17 Hanna, I'm sorry. Are you qualified in this area?

18 MR. KINGSBURY: From what I understand of  
19 Dean Baskerville's -- the things I've read, Dean  
20 Baskerville is dealing with management approaches and  
21 processes that go far beyond my specific knowledge  
22 which, as you can appreciate, relates to the effects of  
23 pesticides primarily from the point of view of direct  
24 imperical data saying: Use of this does that.

25 I think Dean Baskerville's knowledge

1 would be using such data but goes far beyond that  
2 database.

3 THE CHAIRMAN: Mr. Hanna, you can  
4 appreciate Dean Baskerville will be with us in the not  
5 too distant future. At that point in time I think you  
6 could fully explore that area.

7 MR. HANNA: Thank you, Mr. Chairman.

8 Q. Can we go back to your witness --  
9 actually to Exhibit 604C, and I would like to turn to  
10 page 68, if we could.

11 MR. KINGSBURY: A. Yes, I'm there.

12 Q. And I'm now looking at Conclusion 2  
13 which I believe you have already spoken to?

14 A. Yes.

15 Q. This is a serious question, it may  
16 not sound like it, it's a serious question. Would you  
17 expect there to be more red-backed voles or moose in  
18 the area of the undertaking?

19 A. Red-backed voles.

20 Q. Would you not agree, therefore, that  
21 the impact on one moose may be comparable in population  
22 terms to an impact on a great number of voles?

23 A. Yes.

24 Q. So that the conclusion that you've  
25 reached here in terms of the species more likely to be

1       affected really is considering the individual and not  
2       the population. Is that a fair statement?

3                   A. If you put this conclusion in the  
4       context of the previous conclusion which says -- I  
5       would tend to disagree, in that the effect is localized  
6       and if the home range for the -- of a population of  
7       red-backed voles encompasses the entire habitat of the  
8       red-backed vole population in a clearcutting, and the  
9       home range of the one moose encompassed an area far  
10      greater than the area of that herbicide treatment area,  
11      I would in fact stand by the statement that -- draw the  
12      conclusion that the potential effect on the population  
13      of red-backed voles would be greater than the potential  
14      effect on the population of moose.

15                  Q. Is your conclusion, regarding the  
16      ability of larger animals to avoid such impacts, not  
17      based on the premise that there are alternate places  
18      for larger species to move to?

19                  A. It's based on the premise that there  
20      are areas outside of the area where the immediate  
21      impacts on plant succession are occurring, which may or  
22      may not provide the variety of habitat requirements for  
23      that species. Whereas, if the species' home range is  
24      confined to the area where those changes in plant  
25      succession are occurring, it obviously has no choice

1 but to either adapt, respond or fail to adapt to the  
2 changes in plant--

3 Q. And if a moose has --

4 A. --succession taking place.

5 Q. Sorry. If a moose has a limited  
6 supply of browse available to it and that browse is  
7 removed, then the consequences would be the same as  
8 they would be for the red-backed voles?

9 A. If in fact the changes in plant  
10 succession were such that it reduced the amount of  
11 moose browse available to a critical level and there  
12 was not, within the remainder of the habitat to which  
13 that moose was confined by the biological constraints  
14 that restrict animal populations, yes, that could in  
15 fact be the resultant consequence.

16 Q. If larger areas were treated with  
17 pesticides -- herbicides, the moose would be faced with  
18 the same problem as the mouse?

19 A. It is --

20 MS. MURPHY: Hold on. That is larger  
21 than what?

22 MR. HANNA: Then I presume that the  
23 witness is concluding, in that the moose can move  
24 outside of his home range. In other words, I think he  
25 is suggesting, I'm taking the inference from what he's



1 saying, that the herbicide applications he's assuming  
2 are not such that they impact on an entire moose range,  
3 a moose territory.

4 MR. KINGSBURY: I didn't suggest that the  
5 moose would have to move outside of its home range if  
6 in fact a portion of its home range was treated with  
7 herbicide.

8 I believe what I stated, Mr. Hanna, was  
9 that if the consequence of the herbicide application  
10 was to reduce available moose browse within the area of  
11 that moose's home range to a sufficient degree that  
12 that was a critical change, that in fact it could  
13 impact on that moose.

14 MR. HANNA: Q. And as the area treated  
15 grows larger the likelihood of that impact also  
16 increases?

17 MR. KINGSBURY: A. As the area treated  
18 grew larger, the potential that plant successional  
19 changes are going to occur in a larger portion of that  
20 moose's home range area, yes.

21 THE CHAIRMAN: Mr. Kingsbury, is it  
22 likely, in your experience, that if wildlife managers  
23 knew that a given population of moose in a given area  
24 occupied a certain geographical area and relied on that  
25 area for their habitat, that (a) the use of herbicides

1 would cover the whole area and, therefore, either drive  
2 them out somewhere else or force them to succumb to the  
3 fact that there is no habitat which will sustain them;  
4 or is it, in your experience, that wildlife managers  
5 take into account, before prescribing the use of  
6 herbicides, those factors; i.e., what range and what  
7 area the moose population requires to sustain itself to  
8 the level that they are seeking to manage that specie?

9 MR. KINGSBURY: The area in which I can  
10 give most direct evidence in this is that through the  
11 Federal Interdepartmental Committee on Pesticides there  
12 are put forward - and I would be in a position to  
13 review on an annual basis - proposals by federal  
14 agencies for pesticide use.

15 Each year in that are included proposals  
16 by the Canadian Wildlife Service to utilize pesticides  
17 on federal lands, federal properties, and I would draw  
18 the conclusion from the fact that often they propose to  
19 use herbicides and cite, as the intended objective of  
20 that use, to modify the habitat in order to enhance the  
21 habitat for an intended species, that your latter  
22 conclusion or your suggestion that wildlife habitat  
23 managers -- wildlife managers are in fact capable of  
24 saying: This use of the material would not  
25 detrimentally affect that wildlife species, is in fact

1 a reliable conclusion.

2 THE CHAIRMAN: And is not that their  
3 purpose in this integrated management--

4 MR. KINGSBURY: Yes.

5 THE CHAIRMAN: --field? .

6 MR. KINGSBURY: Yes.

7 THE CHAIRMAN: To basically say: There  
8 are other interests out there, some of them are timber  
9 interests, harvesting interests, there are also  
10 wildlife interests out there that have to be preserved  
11 and protected and, in prescribing various uses of  
12 either things like site preparation, use of herbicides,  
13 et cetera, these various factors are taken into account  
14 and the various other uses are taken into account?

15 Is that your experience?

16 MR. KINGSBURY: That's correct. And in  
17 'integrate' is implicit the notion that habitat  
18 modifications occur from a wide range of activities and  
19 that one must integrate the total effect on the habitat  
20 before one comes to conclusions regarding how wildlife  
21 will respond to those.

22 THE CHAIRMAN: Thank you.

23 MRS. KOVEN: I don't remember receiving  
24 any evidence from the Ministry of Natural Resources  
25 that they ever made applications to do herbicide

1 treatment to enhance wildlife habitat.

2 MR. KINGSBURY: I was making--

3 MRS. KOVEN: You are making reference  
4 strictly to the--

5 MR. KINGSBURY: --reference to the  
6 federal agencies.

7 MRS. KOVEN: --federal. Yes.

8 MR. KINGSBURY: Yes. I am aware of the  
9 use of insecticides within Ontario specifically  
10 requested by wildlife managers and that was, oh, for a  
11 number of years there were applications to apply  
12 insecticides to protect both moose and deer wintering  
13 areas from destruction by defoliators.

14 MR. HANNA: Q. If herbicides are used to  
15 treat the optimum habitat for moose and they are forced  
16 to move to sub -- they may be forced to move to  
17 sub-optimal areas in order to obtain necessary habitat  
18 elements; is that correct?

19 MR. KINGSBURY: A. And I would assume  
20 you're -- given the herbicide use patterns, you're  
21 talking about optimal in terms of browse availability  
22 and production?

23 Q. I think really our discussion is  
24 dealing with browse. I think we can -- we're not  
25 talking, I don't think, about treating late winter



1       yarding areas with the herbicides.

2                   A. Right. Then your question, again if  
3       you'd repeat it?

4                   Q. If the herbicides are used to treat  
5       the optimum habitat, the optimum browse for moose, does  
6       it not follow that they may be forced to move to  
7       sub-optimal areas in order to obtain the necessary  
8       habitat?

9                   A. Depending on the proportion -- again,  
10      we're back to the -- at this point it becomes important  
11      to look at the scale of the herbicide use, what  
12      proportion and where that optimal browse production  
13      area might be.

14                   For instance, as you are aware, Mr.  
15      Hanna, if it's nearby suitable cover at certain times  
16      of the years it may be a critical area; whereas, if  
17      it's further removed from cover, even though there's  
18      lots of browse there, the moose may in fact not be  
19      capable or able to utilize it.

20                   Q. Would you agree that by forcing  
21      animals to use sub-optimal habitat that you can impact  
22      them both in terms of their resiliency to other  
23      environmental stresses and also lower their overall  
24      productivity?

25                   A. I believe that's a valid biological

1 principle, yes.

2 Q. Would you agree that your conclusion  
3 regarding mobility of larger wildlife species is based  
4 on the assumption that there's adjacent vacant or  
5 under-utilized habitat?

6 A. It certainly is an important  
7 consideration, but it's not a -- it's a site-specific  
8 condition that could be evaluated on a site-specific  
9 situation.

10 Q. I appreciate that. But, again, in  
11 that particular site the only way the moose can move is  
12 if there's a vacant site that's not being used?

13 A. You're certainly dealing with a valid  
14 biological hypothesis. I would not argue that.

15 Q. Is it common to find vacant habitats  
16 when an eco-system is operating at its carrying  
17 capacity?

18 A. Carrying capacity for a species?

19 Q. Yes.

20 A. Implicit in my understanding of  
21 carrying capacity would be that you are capturing the  
22 idea that the habitat cannot support, under the  
23 conditions that are present there which I would include  
24 human activities in the area, an increase in the  
25 population or sustain an increase in the population.

1                   Q. Well, let's take an example that  
2                   you're familiar with, song birds. If I remove a  
3                   portion of the song bird habitat, which includes many  
4                   territories of song birds, is it typical to find that  
5                   the density of song birds in the adjacent habitat will  
6                   change or does it remain the constant?

7                   A. If you remove habitat being utilized  
8                   by a species, you're suggesting --

9                   Q. We harvest an area.

10                  A. Okay. Can the individuals previously  
11                  utilizing that habitat simply move next door; is that  
12                  what you are suggesting?

13                  Q. Yes.

14                  A. No.

15                  Q. Thank you. It seems to me then that  
16                  your conclusion with respect to the ability of large  
17                  animals able to move, holds only as long as the  
18                  carrying capacity of the range has not been reached?

19                  A. Yes, but I would say in terms of that  
20                  carrying capacity being contingent on one  
21                  environmental -- one habitat -- one critical habitat  
22                  parameter that is affected.

23                  Q. Is winter browse availability a  
24                  factor of the sort you're describing?

25                  A. It could be.

1 Q. Conclusion No. 3 on page 68.

2 THE CHAIRMAN: Do you normally utilize  
3 herbicides in the winter time?

4 MR. KINGSBURY: No.

5 THE CHAIRMAN: Mr. Hanna, we are going to  
6 find a spot soon to break for lunch. We are  
7 contemplating taking three quarters of an hour for  
8 lunch to, again, give you the maximum time you can  
9 today.

10 MR. HANNA: Well, I'm game, whenever it's  
11 appropriate for the Board, Mr. Chairman.

12 THE CHAIRMAN: All right. Can you give  
13 us any indication where you are in your examination?

14 MR. HANNA: Not as far as I would like to  
15 be. It's close to halfway.

16 THE CHAIRMAN: Okay. We will return at  
17 one o'clock.

18 ---Luncheon recess taken at 12:15 p.m.

19 ---On resuming at 1:13 p.m.

20 THE CHAIRMAN: Thank you. Be seated,  
21 please.

22 Mr. Hanna?

23 MR. HANNA: Mr. Chairman, again I've  
24 taken out Mr. Hynard's faithful tool, the chain saw,  
25 and tried and done my best here to truncate things, as



1 much as can be expected. I am going to do my very best  
2 to get finished today.

3 I would just ask, Mr. Kingsbury, I am  
4 just reflecting on what happened this morning. I truly  
5 appreciate your attempt to make things clear to me, but  
6 if we can try and, if possible, keep the question -- I  
7 want to try and get through this today if we can, so if  
8 we can try and keep things as -- and I will try and  
9 make my questions as clear as possible.

10 MR. KINGSBURY: Okay.

11 MR. HANNA: I realize it was both of us,  
12 on both sides of the fence, but if we can move along as  
13 quickly as possible I would really appreciate it.

14 Q. What I would like to do, Mr.  
15 Kingsbury, now is I would like to quickly go through in  
16 Exhibit 604C, the ESSA report, subsequent to the  
17 conclusions -- following the conclusions is a section  
18 on evidence?

19 MR. KINGSBURY: A. Yes.

20 Q. And I'd like to review there -- there  
21 is a number of studies that are referenced there and I  
22 would like to just get some -- your views on several  
23 points dealing with some of those studies.

24 A. okay.

25 MR. HANNA: That's where I'm going in

1       this next series of questions.

2                   THE CHAIRMAN:   Very well.

3                   MR. HANNA:   I've just removed another  
4       question, Mr. Chairman.   I'm doing this on the fly.

5                   MS. SEABORN:   What page number?

6                   MR. HANNA:   Yes.   I am going to be  
7       actually dealing with pages 67 through to 75.   That's  
8       what I'll be dealing with in Exhibit 604C.

9                   Q.   Okay.   If we could look at page 69,  
10      please?

11                  MR. KINGSBURY:   A.   I'm there.

12                  Q.   I'm sorry?

13                  A.   I'm there.

14                  Q.   Okay.   In the second paragraph, and I  
15      believe it's the last sentence there, says:

16                         "Any conclusion regarding the effects of  
17                         herbicide-induced changes should be  
18                         evaluated in the context of the changes  
19                         occurring in the few years earlier."

20                         Which is the harvest; right?

21                  A.   Yes.

22                  Q.   Now, while I understand the thrust of  
23      what's being said there, would it not be even more  
24      relevant to consider the effects of herbicide-induced  
25      changes not only on that history of that particular

1 site, but even more so in the context of the forest  
2 estate as a whole?

3 A. Yes, agreed, it's essential. As a  
4 for instance, the past history on that forest estate  
5 may or -- may have enhanced or reduced that overall  
6 habitat for a given wildlife species.

7 Q. Right. So that to make these  
8 decisions one should not just look at that site, but  
9 one has to look at the whole system and the components  
10 in it in deciding on what is an appropriate course of  
11 action?

12 A. I would agree.

13 Q. Is this not the essence of the  
14 habitat supply analysis approach advocated by Dr.  
15 Baskerville?

16 A. I'll take your word for it.

17 THE CHAIRMAN: Are you familiar, Mr.  
18 Kingsbury, with Dr. Baskerville's supply habitat  
19 analysis?

20 MR. KINGSBURY: In the most general of  
21 terms, yes.

22 MR. HANNA: Q. On page 70 there are  
23 three factors there towards the bottom of the page.

24 MR. KINGSBURY: A. Yes.

25 Q. And they indicate ways in which

1 herbicides might affect wildlife. Again, we are  
2 dealing just with Link 5. Just to put this in context,  
3 this is all Link 5 that we're dealing with here just so  
4 we make sure we understand that.

5 And these are three ways in which the  
6 effects may be felt or exhibited; is that correct?

7 A. Three major ones, there could be  
8 others.

9 Q. Okay. Now, I've asked to be put up  
10 behind you Exhibit 482 which is a sketch that was  
11 developed by Dr. Euler with respect to ideal moose  
12 habitat.

13 A. Yes.

14 Q. And basically what he has done there  
15 is he's taken a block of forest that's 10 kilometres by  
16 10 kilometres and said: If we get this proportion of  
17 habitat in that area we will end up with the moose  
18 density indicated at the top, which is two moose per  
19 square kilometre. Do you understand basically what's  
20 being presented there?

21 A. Yes.

22 THE CHAIRMAN: Wasn't it that you will  
23 end up with the habitat necessary to support two moose  
24 per kilometre?

25 MR. HANNA: That's correct, Mr. Chairman.



1 THE CHAIRMAN: Not necessarily the two  
2 moose?

3 MR. HANNA: Absolutely, yes. I  
4 appreciate that.

5 Q. But that that would be potentially  
6 able to carry -- its carrying capacity would be two  
7 moose per square kilometre.

8 MR. KINGSBURY: A. Okay.

9 Q. Now, on page 71, at the top of page  
10 71 there is reference there to an article by McNamee  
11 which I believe is the effects monitoring report?

12 A. Yes.

13 Q. And it's indicated there that the  
14 results of herbicides could result in canopy closure  
15 being advanced by five to ten years?

16 A. I'll go along with that.

17 Q. Okay. Now, I'm trying to look at  
18 Exhibit 482 and say: Now, if we attempted to do that,  
19 if we went in and used herbicides and, in fact, we  
20 advance canopy closure, in fact that 40 per cent of  
21 shrub early -- see that, where he has got the fifth  
22 category there, the shrub early?

23 A. Yes.

24 Q. I think that means early  
25 successional, could well be reduced?

1                   A. I guess from my understanding of  
2 plant succession canopy closure, which would indeed  
3 have a major effect on shrub on the site, is something  
4 that with or without herbicides, likely in most boreal  
5 sites - and, again, I should be relying on foresters to  
6 provide this information - is something that is not  
7 going to occur until perhaps 10 to 20 years down the  
8 line.

9                   Q. I understand that. But I think what  
10 is indicated here is that if you apply herbicides you  
11 can - and I think we've heard it, the Board's heard it  
12 on a number of occasions - the whole purpose of  
13 applying herbicides is to in fact truncate succession  
14 and move more quickly into stages which would be  
15 productive from a commercial timber point of view?

16                  A. I wouldn't argue with that. It would  
17 also truncate growth of the shrub component and, to a  
18 certain extent, would truncate that back into early  
19 stages of shrub growth.

20                  In fact, that would be the most direct  
21 effect of the herbicide by having a negative impact on  
22 shrubs, not having a direct positive effect on  
23 conifers, but simply by having a direct negative effect  
24 on shrubs, changing the habitat for conifer species so  
25 that they would in fact be capable of growing faster

1 because there would be less competition.

2 Q. Right. Can you --

3 A. At the same time, the fact that those  
4 conifers have been released does not in any way  
5 indicate that all of a sudden those conifers have  
6 immediately attained closure.

7 So after the herbicide application, I  
8 would suggest that in most, if not all instances you  
9 would still be looking at a period of time of - and if  
10 I might just put a figure out, I'm saying it's open to  
11 challenge - of say some 10 years or so when -- likely  
12 you would still have very aggressive shrub growth and  
13 that during much of that time there would in fact  
14 perhaps be a fair bit of browse available on the site.  
15 And I believe that's supported by the study I indicated  
16 that nine years after glyphosate treatment there was in  
17 fact a lot of moose browse on that site.

18 Q. We're going to come to that, but --

19 A. I guess the question then that comes  
20 to mind, if I might just carry on, is: In the control  
21 site, which in that situation would presumably capture  
22 two things. One, that there wasn't more rapid conifer  
23 growth and that, in fact, the growth on the site was  
24 primarily the growth of the natural regeneration  
25 including the shrubs, there was nine years after the

1 time of herbicide application a lot less moose browse.

2 And that says two things. One is that  
3 moose browse is constantly changing on a site and  
4 whether it is a conifer dominated site or a hardwood  
5 dominated site, it may be in fact be decreasing over  
6 time as things grow.

7 Q. In all respect, Mr. Kingsbury, you  
8 haven't answered my question and I wanted to -- and I'm  
9 trying to keep these questions as focused as possible.

10 I asked you about the sentence here, and  
11 it says:

12 "Advancing the canopy closure..."

13 I understand all those sorts of things  
14 and I assure you that I'm going to talk to you in  
15 detail about the Newton study.

16 THE CHAIRMAN: Does it not say "could be  
17 advanced"?

18 MR. KINGSBURY: It is speculative.

19 MR. HANNA: Q. Fine. It's speculative,  
20 and I'm asking you if that did occur, that speculation,  
21 what would be the consequences in terms of proportions  
22 of the habitat types that are suggested by Dr. Euler as  
23 being ideal moose habitat?

24 THE CHAIRMAN: But, Mr. Hanna, he's  
25 indicated in his answer, as I understood it, that this



1 would not happen overnight. This would not be an  
2 immediate effect, it would take place over time. Is  
3 that not correct, Mr. Kingsbury? There wouldn't be  
4 immediate closure?

5 MR. KINGSBURY: That's correct. And one  
6 of the things I'm saying is, it says five to 10 years.  
7 That suggests you could think of that as happening five  
8 or 10 years after the herbicide application.

9 I may still be well down the line and, in  
10 that interval, before that happens there is still the  
11 potential for lots of shrub growth.

12 MR. HANNA: Q. Is that diagram behind  
13 you not actually a temporal profile? In other words,  
14 that is a dynamic state, what's now shown there is 30  
15 per cent shrub early, will in 30 years down the road  
16 will be whatever, upland deciduous or whatever.

17 In other words, it's the temporal  
18 component I'm trying to deal with and I seem to not be  
19 getting anywhere on it.

20 MR. KINGSBURY: A. Well, I guess one of  
21 the points I would make, Mr. Hanna, is that it's  
22 possible in that scenario, if you leave it alone the  
23 early shrub component is going to change, obviously;  
24 it's not going to be early shrub it's going to be later  
25 shrub. Perhaps that is going to reduce available moose

1 browse.

2 I would suggest that if you took 20 per  
3 cent of that and treated it with herbicide you may in  
4 fact take that 20 per cent so that down the cycle not  
5 necessarily represents early shrub lost more quickly  
6 but, in fact, takes it back to early shrub development.  
7 That may in fact be there as long or longer than the  
8 early shrub left untouched.

9 Q. Are you suggesting then that  
10 advancing closure will not influence the available  
11 shrub component in the forest?

12 A. It will over time, but in the time  
13 interval prior to that canopy closure occurring, partly  
14 dependent on where the shrub growth was at at the time  
15 the herbicide application took place and how far  
16 advanced it was, there may in fact be a period or an  
17 interval during that time period before canopy closure  
18 occurs when, on that treated site, relative to what was  
19 going to happen if you left it untreated, there may in  
20 fact be an increase of the shrub growth on that site  
21 and the moose browse available. And there is hard data  
22 present before this Board to indicate that.

23 Q. We will discuss that in a moment.  
24 Let me just ask you one last question to close out on  
25 this.

1                   If by whatever means - I'm not going to  
2 go back through this temporal concept - but if those  
3 proportions would change that are shown there, you  
4 would agree with me it will affect the carrying  
5 capacity of the range?

6                   A. I would suggest that no matter what  
7 you do to that site, those temporal portions are going  
8 to change.

9                   Q. That wasn't my question.

10                  A. And that in doing they will change --  
11 potentially change the carrying capacity of that range.

12                  Q. And on page 71 there is reference  
13 there to a study by Telfer in the first full paragraph.  
14 Do you see that, Telfer, 1976?

15                  A. That's a study -- a reference citing  
16 the scale of herbicide applications relative to overall  
17 scope of forest harvesting?

18                  Q. When Telfer published his paper,  
19 given what you have heard in terms of the change in  
20 application of herbicides, would you have expected  
21 things to change dramatically since then?

22                  THE CHAIRMAN: What about the change --  
23 what do you mean change in application of herbicides?

24                  MR. HANNA: Mr. Chairman, I believe in  
25 this particular document there is, again on page 11 or

1       somewhere, or I can show another in the actual witness  
2       statement, that over the last eight years there been a  
3       threefold increase in herbicide application rates.

4               So what I'm asking in this particular  
5       case, this study was done in '76, prior to the  
6       extensive use of herbicides.

7               MS. CRONK: It's the amount of  
8       herbicides -- I'm sorry Mr. Chairman, it's the amount  
9       of herbicides as opposed to the rate at which they're  
10      applied.

11              THE CHAIRMAN: Right. And put the  
12      question in the context of the change that you are  
13      discussing. It's hard for the witness to know what  
14      change you are talking about.

15              MR. HANNA: Q. The sentence on page --  
16      the second sentence on page 71, the first full  
17      paragraph there says:

18                      "Applications are small scale compared to  
19                      the scope of forest harvesting."

20              Now, if 35 per cent of the forest is  
21      being treated with herbicide, would that be small  
22      scale?

23              MR. KINGSBURY: A. Certainly a third of  
24      a harvested area would be a substantial portion of a  
25      harvested area.



1       somewhere, or I can show another in the actual witness  
2       statement, that over the last eight years there been a  
3       threefold increase in herbicide application rates.

4               So what I'm asking in this particular  
5       case, this study was done in '76, prior to the  
6       extensive use of herbicides.

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9       of herbicides as opposed to the rate at which they're  
10      applied.

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12      question in the context of the change that you are  
13      discussing.  It's hard for the witness to know what  
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19                      the scope of forest harvesting."

20                      Now, if 35 per cent of the forest is  
21      being treated with herbicide, would that be small  
22      scale?

23              MR. KINGSBURY:  A.  Certainly a third of  
24      a harvested area would be a substantial portion of a  
25      harvested area.

1 Q. Right. So that the conclusion -- the  
2 simple question is: The conclusion he arrived at at  
3 that time was based upon current herbicide application  
4 rates at that time, and they have changed?

5 THE CHAIRMAN: Well, application rates,  
6 it's our understanding haven't changed. They are on  
7 the label of the herbicide and unless there is a change  
8 to the regulation in how much you can apply per square  
9 metre or whatever, that's the application rate.

10 You are talking about the...

11 MR. HANNA: Excuse me, Mr. Chairman. My  
12 semantics have got ahead of me. I'm not as good a  
13 wordsmith as I probably should be. I'm talking about  
14 area treated, not the application rate.

15 Q. The area treated has changed since  
16 '76 to today?

17 MS. MURPHY: In the area discussed by  
18 Telfer? The area discussed by Telfer is in Oregon, I  
19 believe.

20 MR. HANNA: It's in Alberta, I believe.  
21 Anyways...

22 MR. KINGSBURY: Mr. Hanna, if you could  
23 like to...

24 MS. MURPHY: I stand corrected, it's not  
25 Oregon.

1 MR. KINGSBURY: If you would like me to  
2 agree that there is more area of herbicide treatment in  
3 Ontario each year, there is evidence and I would concur  
4 with it.

5 MR. HANNA: Q. Let me ask you this  
6 simply: Do you know the level of herbicide application  
7 when Telfer did his work and arrived at this  
8 conclusion?

9 THE CHAIRMAN: Do you mean areas dealt  
10 with by Telfer in his study?

11 MR. HANNA: Yes, the areas which is --  
12 and I would submit to the Board that that was in  
13 Alberta that he did his work.

14 MR. KINGSBURY: I'm not aware of the  
15 scale of the use that Telfer refers to in his document.  
16 If you are asking me to accept that that scale may be  
17 smaller scaled than is currently or in recent history  
18 the case in Ontario, I would be happy to accept your  
19 conclusion.

20 MR. HANNA: Q. Yes. Was glyphosate used  
21 operationally at this time?

22 MR. KINGSBURY: A. No.

23 Q. Was 2,4-D and 2,4,5-T registered for  
24 use in forestry at that time?

25 A. Yes.

1 Q. And were they the most common  
2 herbicides used at that time?

3 A. I believe that's correct.

4 Q. The next reference there is to  
5 Dunker, 1986; do you see that?

6 A. Yes.

7 Q. Are you familiar with the work by Dr.  
8 Dunker?

9 A. If you give me a moment to just  
10 verify that, that reference. That is a Ph.D. thesis  
11 from the University of New Brunswick and I have not  
12 read that thesis.

13 Q. It was done under Dr. Baskerville's  
14 supervision?

15 THE CHAIRMAN: Well, he indicated he  
16 hasn't read that thesis, so...

17 MR. HANNA: Well, I didn't know whether  
18 he knew who it what was prepared.

19 MR. KINGSBURY: His first name.

20 MR. HANNA: Q. Peter Dunker.

21 MR. KINGSBURY: A. I believe that I was  
22 involved in a process that Mr. Dunker was involved in  
23 where we were discussing this kind of issue, but I'm  
24 not aware of and haven't read his thesis.

25 Q. Was his research dealing primarily



1 with deer?

2 A. Yes.

3 Q. Are the habitat requirements of deer  
4 quite different than the habitat requirements of moose?

5 A. Absolutely.

6 Q. Did his study examine the impacts of  
7 glyphosate or did it deal with 2,4-D?

8 A. I believe it would -- given that I  
9 don't have knowledge of it, but I would assume that  
10 from the time frame...

11 MS. CRONK: I'm sorry. No disrespect  
12 intended Mr. Kingsbury. Let's not assume. Let's not  
13 guess, if he doesn't know then...

14 THE CHAIRMAN: Yes. There is no sense,  
15 Mr. Kingsbury, in speculating if you aren't aware of  
16 the study, because whatever your answer ends up being,  
17 it's mere speculation--

18 MR. KINGSBURY: Right.

19 THE CHAIRMAN: --and of little weight  
20 value.

21 MR. HANNA: Q. On page 68 -- in fact I  
22 already dealt with this. We don't need to go back  
23 there.

24 We have talked about the lack of  
25 literature dealing with the effects of herbicides on

1 wildlife habitat and the consequences of that. We  
2 don't need to go back over that.

3 THE CHAIRMAN: Well, just hold on. I'm  
4 not sure Mr. Kingsbury has agreed to that.

5 MR. HANNA: Okay.

6 THE CHAIRMAN: That may be your  
7 submission, Mr. Hanna.

8 MR. HANNA: I believe I have asked him  
9 that question before, Mr. Chairman, but I'm happy to  
10 have him...

11 THE CHAIRMAN: I'm not sure I got his  
12 answer on that, that there is a lack of literature on  
13 the subject.

14 MS. MURPHY: The question had something  
15 to do with the lack of literature and the consequences  
16 of it which apparently was agreed to, but I don't have  
17 that in my notes.

18 MR. HANNA: Can we turn to page 68...

19 THE CHAIRMAN: Is there a lack of  
20 literature?

21 MR. KINGSBURY: The literature primarily  
22 deals with the effects on the habitat. I believe you  
23 are -- if you are making reference to literature which  
24 deals with specific studies that go all the way through  
25 Link 5, if you want to call it that, all the way from

1 pesticide application to the eventual abundance and  
2 distribution of animals, I would agree with you that  
3 the literature that goes all the way through in one  
4 study that entire hypothesis, there are in fact not a  
5 great number of studies that do that.

6 But I would qualify that by saying,  
7 there's a great deal of literature that goes from  
8 pesticide to the change in the habitat, and there is  
9 also a great deal of literature that goes from change  
10 in habitat to abundance of animals. They in fact fall  
11 in two quite different areas; one of which is direct  
12 pesticides effects, the other which is wildlife habitat  
13 requirements.

14 MR. HANNA: Q. Could you give me an  
15 example of what you mean with respect to the latter in  
16 terms of moose?

17 A. Moose require --

18 Q. No, the literature. You are  
19 suggesting there is an extensive literature. I'm  
20 asking, can you give me some example of that? Is it  
21 listed in the report that you provided here?

22 A. Well, it would be the type of  
23 material you would find in the Guidelines for Provision  
24 of Moose Habitat and the database on which those  
25 guidelines would in fact have been created.

1 Q. Well, we will come to that one also.  
2 Can you look on page 68, the first full paragraph.

3 A. Yes.

4 Q. The first sentence. Could you read  
5 that, please?

6 A. "Direct evidence of the effects on  
7 wildlife of habitat changes resulting  
8 from herbicide use is extremely limited."

9 Q. So you are saying that we know the  
10 effects of habitat changes on wildlife and we know the  
11 impact of herbicides on habitat, but we haven't been  
12 able to link it up?

13 A. I'm saying that studies that make  
14 that link for us are limited.

15 Q. But from what you have told me, it  
16 shouldn't be difficult to make that link.

17 A. I'm saying that there is bodies of  
18 literature available for both of them. I wouldn't  
19 suggest it's an easy link to make and I suspect most  
20 wildlife managers would concur.

21 Q. In undertaking your review of the  
22 ESSA report, did you conclude that the review of the  
23 literature contained in there was comprehensive and  
24 complete as it dealt with herbicide impacts on wildlife  
25 habitat?

1 MS. MURPHY: Excuse me, but we have had  
2 extensive discussion in the cross-examination by Mr.  
3 Castrilli about whether this citation, the citations  
4 here cover all of the literature that exists and the  
5 answer has been given several times.

6 MR. HANNA: Mr. Chairman, my  
7 understanding in discussing it with Mr. Castrilli - and  
8 I'm at some disadvantage here because I haven't read  
9 the transcripts -is that he did not deal with the  
10 subject that I have specifically dealt with.

11 He did deal with the question in terms of  
12 toxicological effects and various direct effects of  
13 herbicides; I do not believe he dealt with the question  
14 of herbicide impacts on wildlife, per se.

15 MS. MURPHY: No, no. I was just pointing  
16 out, the question doesn't matter what subject area we  
17 are talking about, the question that was raised is:  
18 Was this intended to be a complete review of all  
19 literature that is discussed in this document.

20 MR. HANNA: That is not my question, Mr.  
21 Chairman.

22 THE CHAIRMAN: Well, okay.

23 MS. MURPHY: I think you get my point.

24 THE CHAIRMAN: Let's repeat the question  
25 and we'll see if we can get you an answer.



1 MR. HANNA: Q. Okay. In undertaking a  
2 review of the ESSA report--

3 MR. KINGSBURY: A. Yes?

4 Q. --did you conclude that the review of  
5 the literature was comprehensive and complete dealing  
6 with herbicide impacts on wildlife habitat?

7 THE CHAIRMAN: What is your opinion on  
8 the work that ESSA did in that area?

9 MR. KINGSBURY: I would suggest to you,  
10 Mr. Hanna, in terms of the distinction I have made  
11 between those two bodies of data that could be used in  
12 going through hypothesis 5 that the ESSA Document in no  
13 way attempted and, in fact in most cases, does not even  
14 address the question of relation of habitat to animal  
15 numbers for moose or beaver or fox or bear, or all  
16 those things that fall within the scope of what this  
17 document presumably is asked to look at.

18 And in fact it limited its discussion of  
19 the scientific literature primarily to the studies that  
20 either go all the way through that hypothesis or to  
21 discussing the habitat changes themselves that result  
22 after a herbicide application.

23 MR. HANNA: Q. My question to you was:  
24 Habitat changes. I will read it again to you, if you  
25 will. Dealing with herbicide impacts on wildlife

1 habitat, not going through the whole thing, wildlife  
2 habitat, the first step in the Link 5.

3 MR. KINGSBURY: A. I would suggest to  
4 you that a lot of the very pertinent data such as what  
5 plant species are affected by what chemicals at what  
6 dosage rates was not covered by this. To a certain  
7 extent it has been dealt with in direct evidence  
8 elsewhere presented by panel members.

9 Q. The ESSA report was undertaken in  
10 1988; correct?

11 A. I believe that's correct, when the  
12 workshop was held.

13 Q. Are you familiar with the work by  
14 Connor in 1986 dealing with winter utilization by moose  
15 of glyphosate treated cut-overs in Ontario?

16 MS. MURPHY: 1988 I believe.

17 MR. HANNA: Q. 1986 I believe.

18 MS. MURPHY: Can I see. it.

19 MR. HANNA: Q. It's a B. Sc. thesis,  
20 Lakehead University.

21 MR. KINGSBURY: A. I'm not personally  
22 familiar with it, no.

23 Q. Would you think that that might be  
24 quite relevant?

25 THE CHAIRMAN: Well, he's not familiar

1 with it, he doesn't know. He can't really speak to its  
2 relevancy if he hasn't heard of it.

3 MS. CRONK: May I have the reference  
4 again, please, Mr. Chairman?

5 MR. HANNA: Actually to make it simple,  
6 Mr. Chairman, it's referenced in the paper by Connor  
7 and Gratz which I'm expecting to speak to the witness  
8 about shortly. It's in the appendix there.

9 THE CHAIRMAN: Well, can you just tell us  
10 what it is so we can relate it to this part of the  
11 cross-examination?

12 MR. HANNA: Yes. It's Connor,  
13 C-o-n-n-o-r, J. F, 1986, Early Winter Utilization by  
14 Moose of Glyphosate-Treated Cut-Overs, Bachelor of  
15 Science in Forestry thesis, Lakehead University,  
16 Thunder Bay, 57 pages.

17 MS. CRONK: Thank you.

18 MR. KINGSBURY: I would make the point  
19 for the Board that the ability of any review agency to  
20 reach data that is obtained in the format of bachelors  
21 theses is in fact totally limited to direct personal  
22 availability.

23 Those thesis -- when I have attempted to  
24 obtain them from universities are not produced, they  
25 are not peer reviewed, they are done as an academic

1 requirement.

2 THE CHAIRMAN: I wasn't sure whether Mr.  
3 Hanna referred to it as a graduate thesis or an  
4 undergraduate thesis.

5 MR. HANNA: It's an undergraduate thesis,  
6 Mr. Chairman.

7 THE CHAIRMAN: Okay. Thank you.

8 MR. HANNA: Q. Can you confirm for me,  
9 Mr. Kingsbury, that there is no reference to this work  
10 by Connor in the ESSA report?

11 MR. KINGSBURY: A. Yes, I confirm that.  
12 As I have indicated, though, I would suspect that any  
13 reference -- one, it would not be available unless it  
14 was actually obtained from the individual and;  
15 secondly, in most cases, most people I believe would  
16 consider it not to be a citable publication in that  
17 it's an unreviewed, unpublished document.

18 Q. And yet in the paper by Connor and  
19 Gratz which we are going to talk about --

20 THE CHAIRMAN: Yes, but with respect, Mr.  
21 Hanna, he just indicated that in order to obtain  
22 these -- for somebody to do a literature search in  
23 order to obtain the document, you might have to have  
24 personal contact with the particular student involved  
25 or author of the paper.

1                   Some other author or some other research  
2           scientist may have, in fact, obtained the paper. That  
3           doesn't mean it's necessarily readily available to  
4           everybody else, No. 1.

5                   And, secondly, it's value as sort of  
6           refereed published literature of a scientific nature  
7           may be somewhat suspect in that form.

8                   MR. KINGSBURY: I'm sure there is lots of  
9           data in bachelors theses that is up to the contemporary  
10          standards for publication, it's simply not available  
11          and generally not cited unless it has been.

12                  MR. HANNA: Q. Well, I'm just simply  
13          saying that the two authors, Connor and Gratz, in  
14          publishing their article in Elsie which is a refereed  
15          journal did in fact quote that paper. So...

16                  MR KINGSBURY: A. Scientists are --

17                  MS. MURPHY: Is the article by J. F.  
18          Connor --

19                  MS. CRONK: Mr. Chairman --

20                  THE CHAIRMAN: All right. Just a moment,  
21          we have three objections at one time.

22                  MS. CRONK: And with the same hand.

23                  THE CHAIRMAN: We will have to deal with  
24          them one at a time.

25                  MS. MURPHY: I asked if we could get



1 access to the document, Mr. Chairman.

2 MS. CRONK: I got up first.

3 THE CHAIRMAN: No, I think Ms. Seaborn  
4 was first in rising.

5 MS. CRONK: I just got it out first.

6 MS. SEABORN: Mr. Chairman, I think we  
7 may be missing something but, first of all, is this  
8 paper before the Board, the Connor and Gratz paper and,  
9 if not, could that be filed right now before we go any  
10 further?

11 I understand that -- I'm aware it's been  
12 provided to the parties under cover of a separate  
13 letter and perhaps that should be before the Board.

14 THE CHAIRMAN: All right. Well, it  
15 hasn't been admitted by the Board to my knowledge  
16 today.

17 MS. SEABORN: No, I don't think so.

18 MR. HANNA: Mr. Chairman -- (handed)

19 THE CHAIRMAN: Okay.

20 MR. KINGSBURY: Mr. Hanna, if you can  
21 just confirm for me that this is the interim report?

22 MR. HANNA: Yes, it is.

23 MR. KINGSBURY: Okay, thank you.

24 THE CHAIRMAN: Exhibit 771.

25 ---EXHIBIT NO. 771: Article entitled: Early Winter

1 Utilization by Moose of  
2 Glyphosate-Treated Cut-Overs, B.  
3 Sc. in Forestry, thesis, Lakehead  
University, Thunder Bay by Connor  
and Gratz, 1986.

4 ---Discussion off the record

5 MR. HANNA: I'm not yet to Connor and  
6 Gratz and perhaps -- hopefully if we can take a short  
7 break and when I get to it I can get another copy. Ms.  
8 Seaborn has not got a copy and I think --

9 MS. SEABORN: I don't want to hold you  
10 up, Mr. Hanna. Just proceed.

11 THE CHAIRMAN: Well, if there is not a  
12 problem with you, Ms. Seaborn, not having a copy, can  
13 we proceed on questioning on this paper now?

14 MS. SEABORN: That's fine. I can share  
15 with my friends to my left perhaps.

16 THE CHAIRMAN: Thank you.

17 MR. HANNA: Thank you, Ms. Seaborn.

18 Q. So just to finish off this, Mr.  
19 Kingsbury. When you arrived at your conclusions in  
20 your witness statement and in Document No. 4, Exhibit  
21 604C, you did not have knowledge of this study?

22 MR. KINGSBURY: A. I'm personally aware  
23 of the...

24 Q. Excuse me. I'm sorry, this study,  
25 I'm back to the --

1 A. The undergraduate thesis?

2 Q. The undergraduate thesis, yes.

3 A. That's correct.

4 Q. Can we continue on to page 71, the  
5 study by Perella, 1985. In the second full paragraph  
6 there--

7 A. Yes.

8 Q. --can you explain to me what is meant  
9 here by herb biomass? I believe the term is used there  
10 about the fourth sentence down.

11 A. Yes, I see the term. Again, I would  
12 like to have Perella in front of me before I gave a  
13 specific answer because I'm not sure of the context in  
14 which he has used it.

15 MS. MURPHY: Do you have Perella with  
16 you?

17 My friend has asked the witness what  
18 Perella meant by a set of words, the witness has said  
19 he doesn't have Perella in front of him, he can't  
20 respond.

21 THE CHAIRMAN: Do you have the study?

22 MR. HANNA: No, Mr. Chairman, I don't. I  
23 could provide it if I didn't. I'm just going by the  
24 words that are presented here in the report.

25 THE CHAIRMAN: Are you familiar with the

1 Perella study?

2 MR. KINGSBURY: I wouldn't be familiar  
3 enough to recall what exactly his definition of herb  
4 biomass was in that study, the context in which he used  
5 it.

6 MR. HANNA: Q. If you look at the last  
7 sentence in that paragraph, he's talking about species  
8 mix in herbs or shrubs.

9 A. Yes.

10 Q. Does that suggest to you that he's  
11 talking about herbs and shrubs as two separate  
12 components of the plant community?

13 A. He may very well -- well, he  
14 certainly is in this context, and it opens the  
15 possibility herb biomass only referred to a portion of  
16 that plant community.

17 Q. In typical, how should I say, plant -  
18 I don't want to say tex, I'll get the wrong term -  
19 lexagon, do herbs include woody species or soft stem  
20 species?

21 A. Soft stem species.

22 Q. And shrubs are woody species?

23 A. Yes.

24 Q. Can you tell me whether herbs are a  
25 major winter food source for large ungulates, in

1 particular, moose in the boreal forest?

2 A. No, they are not.

3 Q. So the relevance of the herb biomass  
4 changing in terms of moose may be of little  
5 significance?

6 A. Certainly in terms of winter  
7 foraging.

8 Q. Yes. The last sentence indicates  
9 that the species mix of shrubs did not change with  
10 glyphosate treatment. Can you explain to me your  
11 interpretation of species mix in this context?

12 A. Again, it's Perella's use of the term  
13 species mix which is of concern here and I could  
14 suggest a -- I'm not going to--

15 MS. MURPHY: Don't do that.

16 MR. KINGSBURY: I'm not going to  
17 speculate.

18 THE CHAIRMAN: It's difficult, Mr. Hanna,  
19 if we don't have the document to at least put to the  
20 witness, even if the witness hadn't seen it before -  
21 and it doesn't occupy a major portion of the document -  
22 we could put it to him at this point and then ask him  
23 to confirm his opinion as to what the author of the  
24 other article might have meant.

25 MR. HANNA: I understand. However, there



1 is the authorship and ownership of this particular  
2 exhibit, and I believe right at the very beginning we  
3 established that Mr. Kingsbury was going to speak to  
4 this exhibit and they are the words of the report.

5 They are not shown as being in quotation  
6 or anything taken directly from that article. So I'm  
7 saying that these are the words of the people who --

8 THE CHAIRMAN: Okay. But you are not  
9 asking him that question. You are asking him what is  
10 meant by the word specie mix in the context that  
11 Perella used it.

12 MR. HANNA: No, my question to him was:  
13 What is your interpretation of species mix in this  
14 context.

15 MS. MURPHY: Which is cited as Perella.

16 MR. HANNA: It is not a direct quotation  
17 from Perella. Perella is a base upon which that  
18 conclusion may have been developed, these are the words  
19 of the author.

20 THE CHAIRMAN: But that is the source for  
21 those words. They are citing a source for those very  
22 words and, surely you will appreciate that various  
23 terms can be used by different authors in a variety of  
24 contexts.

25 MR. HANNA: Q. Mr. Kingsbury, can you

1 give me the way that you use the term species mix?

2 THE CHAIRMAN: Just a moment. Hold on a  
3 second, Mr. Hanna. The statement says:

4 "Glyphosate did not change the species  
5 mix in herbs or shrubs at either site."

6 They are talking about two sites, they  
7 are talking about two sites that presumably form part  
8 of the study by Perella. I haven't reviewed the  
9 Perella study either so I can't confirm that, that's  
10 speculation on the Board's part.

11 So to ask him what is meant by species  
12 mix in the context of 'at either site', when we hasn't  
13 read the article, or if he has read the article he is  
14 not familiar enough with it without being reminded  
15 again what it says, to even give an opinion on what the  
16 author meant.

17 MR. HANNA: Correct, and I'm moving away  
18 from that, Mr. Chairman. I accept that position. I'm  
19 simply asking the witness now at this time, independent  
20 of Perella, his definition of species mix.

21 THE CHAIRMAN: Okay, that's a fair  
22 question.

23 MR. KINGSBURY: Species mix would be the  
24 variety of species that is present on a site. It would  
25 be an enumeration of numbers of species that are named

1 and it may or may not include some measure of their  
2 relative abundance; one to another.

3 MR. HANNA: Q. So it could be  
4 presence/absence?

5 MR. KINGSBURY: A. It could be  
6 presence/absence, it could be relative presence.

7 Q. Would you say that species mix or  
8 species dominance - species mix in terms of  
9 presence/absence - or species dominance is more  
10 important in terms of moose habitat?

11 A. I would say that because all species  
12 of plants are not equivalent in terms of the browse  
13 quality that they offer to moose, that in fact it would  
14 be the presence and abundance of selected major species  
15 that would be of primary importance in terms of moose  
16 browse qualities of the site.

17 Q. So if a species mix was measured in  
18 terms of presence/absence, you would agree with me that  
19 you could maintain the species mix on a given site and  
20 have a major shift in the quality of a site in terms of  
21 moose habitat through changes in dominance?

22 A. If in fact the species mix was not  
23 reflecting -- was simply presence/absence, yes.

24 Q. Can we move to page 73, please.

25 A. Yes.

1 Q. The first full paragraph starting  
2 with:

3 "Some light browsing..."

4 A. Yes.

5 Q. I'm particularly interested in the  
6 last sentence that concludes that:

7 "Herbicides could have their greatest  
8 impact during winter when energy costs  
9 are highest and mobility is lowest."

10 A. Yes.

11 Q. Do you agree with that?

12 A. I think that's a fair statement, yes.

13 Q. Would it also not be fair to say that  
14 because the mobility of moose during the winter is much  
15 lower, that their ability to cope with, if you will,  
16 the local-type impacts that we've talked about in terms  
17 of herbicide is reduced?

18 A. I would say it can be. Mobility can  
19 be much lower depending on snow conditions, et cetera  
20 and that -- as their mobility is lessened, in fact, the  
21 impacts, as you've defined them, could be most serious.

22 Q. Would you agree that since moose  
23 primarily use the edges of clearcuts during the winter,  
24 that the major immediate impact of herbicides would be  
25 around the perimeter of the clearcuts as opposed in the

1       centre of large clearcuts that might be up to a  
2       kilometre wide?

3                   A.   I think that the major impacts--

4                   Q.   In moose.

5                   A.   --could be because of the changes in  
6       the browse availability in those sites, if in fact they  
7       are critical to moose in winter in the specific places  
8       that those changes occur, yes.

9                   Q.   It would be felt to the greatest  
10       extent approximal to the edge because that's where the  
11       habitat is used most intensively during that critical  
12       winter period?

13                  A.   Yes.

14                  Q.   Can we move on to the next paragraph  
15       which is Kennedy. Based on the work of Kennedy and  
16       many others, I would suggest some of which are  
17       referenced in this report, would you agree that the  
18       impact of glyphosate is significantly different in  
19       terms of its impact on wildlife habitat than 2,4-D?

20                  A.   Certainly glyphosate can impact  
21       differently than 2,4-D. It partly depends on the --  
22       well, first of all, as always, the species present on  
23       the site because there are differences in their  
24       sensitivity to glyphosate and to 2,4-D.

25                  Q.   But certainly Kennedy concluded that



1       there is a very significant difference; is that not  
2       correct?

3                   A.   It would depend on the sites --

4                   Q.   I am talking about--

5                   A.   --I would suggest to you.

6                   Q.   --the words that are in front of you  
7       there.

8                   A.   Kennedy in fact finds differences on  
9       the sites he treated in terms of the impacts, and  
10      that's not unexpected.  Basically this confirms the  
11      fact that the two herbicides have differential effects  
12      on a variety of plant species, and that's well  
13      documented.

14                  THE CHAIRMAN:  Is your evidence, Mr.  
15      Kingsbury, that you could get different ratios on  
16      different sites?

17                  MR. KINGSBURY:  Absolutely, because -- of  
18      course, one of the major factors is what the plant  
19      community, to be begin with, is on the site.  It's --

20                  MR. HANNA:  Q.  Okay.  Can you give me an  
21      example where you would expect the impacts of 2,4-D to  
22      be greater than glyphosate on moose browse, the  
23      substance of Mr. Kennedy's paper here?

24                  MR. KINGSBURY:  A.  I'm not sure that  
25      I -- I'm not trying to defend the suggestion that

1 glyphosate doesn't necessarily impact more severely on  
2 moose browse than 2,4-D, I'm simply saying that that  
3 would not always -- I don't believe that would always  
4 be the case, that you would have to go to each site.

5 As a for instance, if I might suggest,  
6 glyphosate could be used in site preparation situations  
7 where, because 2,4-D has to basically be applied to  
8 actively growing foliage, glyphosate could be applied  
9 to a situation prior to any growth occurring and that  
10 that immediate impact might in fact be that if 2,4-D  
11 was applied to a site where it impacted on browse that  
12 was already available and being utilized; whereas, it  
13 hadn't even begun to be utilized on the  
14 glyphosate-treated site.

15 Q. But my question to you was: Can you  
16 give you an example?

17 A. I just did, I believe.

18 Q. No, but you didn't. You said if  
19 glyphosate was put on before the plants started to  
20 grow, you said we wouldn't put 2,4-D on before the  
21 plants would grow.

22 A. Right.

23 Q. So give me an example where I would  
24 use glyphosate in one situation, 2,4-D in the same  
25 situation?

1 A. In the same situation.

2 Q. Whereby I would end up with a greater  
3 impact, a greater negative impact on moose browse from  
4 2,4-D?

5 A. I just did give you that situation, I  
6 believe, Mr. Hanna, in that if 2,4-D was used on that  
7 site it would -- the immediate impact would be to  
8 reduce browse that was there on the site present and  
9 available for moose to utilize.

10 Q. And if I treated that same browse  
11 with glyphosate, what would I end up with?

12 A. That browse -- I suggested that you  
13 might use glyphosate on that site before the browse was  
14 there.

15 Q. That's not a comparable situation.

16 A. It's the same site, Mr. Hanna. I'm  
17 suggesting that --

18 THE CHAIRMAN: Okay. With respect, Mr.  
19 Kingsbury, I think that we are somewhat dealing with  
20 apples and oranges in that particular example.

21 I think what Mr. Hanna is asking is:  
22 Given what constitutes moose browse, to your knowledge,  
23 can you think of an example whereby on the same site  
24 you would use either of the two chemicals and end up  
25 with lesser negative impacts from the use of 2,4-D.

1                   MR. KINGSBURY: I suspect if I sat with a  
2 detailed information on the range of selection of those  
3 two chemicals and on the plant species and the relative  
4 values to moose browse I could, but I will submit that  
5 perhaps I couldn't.

6                   THE CHAIRMAN: Okay. Will you go this  
7 far and, if you can't, don't. Will you concede that,  
8 generally speaking, the negative impacts are greater  
9 from the use of glyphosate with respect to moose browse  
10 than 2,4-D?

11                  MR. KINGSBURY: The immediate short-term  
12 negative impacts? Perhaps it would be expeditious to  
13 get into Exhibit 722 because it provides direct  
14 evidence on this, I believe.

15                  THE CHAIRMAN: What is 722?

16                  MR. KINGSBURY: 722 is Browse  
17 Availability after Conifer Release in Maine's  
18 Spruce/Fir Forest. It deals with 2,4-D mixtures,  
19 2,4,5-T plus 2,4-D, but from the evidence that is  
20 presented --

21                  THE CHAIRMAN: We have got one up here  
22 anyways. Go ahead.

23                  MR. KINGSBURY: The evidence presented in  
24 Table 3 on page 646 of that article indicates that  
25 nine years after herbicide treatment the browse index,

1       which is a measure of relative abundance of accessible  
2       browse on glyphosate-treated sites is recorded as being  
3       3 and 7; on 2,4,5,-T plus 2,4-D sites it's recorded as  
4       being 5 and 7; and on 2,4,5-T sites it's recorded as  
5       being 3 to 5.

6                   MR. HANNA:  Q.  3 to 7; is it not?  The  
7       last one is a 7 before the control?

8                   MR. KINGSBURY:  A.  No, I'm talking about  
9       2,4,5-T alone, Mr. Hanna.

10                  Q.  I was talking about 2,4-D.

11                  A.  I realize that, okay, and there is  
12       not data in this table that applies directly to 2,4-D.

13                  I think this is an indication though of  
14       the -- and perhaps will indicate to the Board some of  
15       my reluctance to say that, you know, allowing the Board  
16       to come to the conclusion or be of the -- gain the  
17       impression that glyphosate necessarily is going to  
18       reduce moose browse in a more severe fashion than 2,4-D  
19       or any other chemical may not in fact be appropriate.

20                  One, it may -- I would suggest to you  
21       that on different sites, depending on the specie --  
22       plant species there it has the potential to reduce it  
23       more or less in the short term and that the response in  
24       the long term may in fact be different.

25                  Q.  Can you turn to Exhibit 771 on page



1 2.

2 MR. HANNA: The covering letter, I'm not  
3 including that as a page, Mr. Chairman.

4 Q. The second page of the article.

5 MR. KINGSBURY: A. Yes.

6 Q. Can you read the last sentence in the  
7 first part paragraph there starting with:

8 "Consequently..."

9 A. "...moose managers are concerned  
10 glyphosate applications will reduce  
11 available browse; thus, moose habitat  
12 quality."

13 Q. And is not the thrust of what they  
14 are saying there that the impacts of 2,4-D and  
15 glyphosate --

16 MS. MURPHY: It doesn't say anything  
17 about 2,4-D.

18 MR. HANNA: Well, the next sentence --  
19 the next paragraph deals with the impact of 2,4-D and  
20 glyphosate.

21 Q. Is not the thrust of what they're  
22 saying, the reason they initiated this study was they  
23 were concerned about the impact of glyphosate being  
24 different than 2,4-D? Was that not the major impetus  
25 for this study?

1                   MR. KINGSBURY: A. It could very well  
2 have been and it would be very appropriate that such a  
3 study be conducted.

4                   I would, however, point out that given  
5 what we have discussed about the changes in moose  
6 browse on a site over time, whether treated with  
7 herbicide or not treated with herbicide, that an  
8 assessment should take into consideration when it's  
9 dealing with something like moose habitat quality the  
10 changes in that habitat certainly over the lifespan of  
11 a moose, as a for instance, but the changes occur over  
12 time and that those changes over time need to be  
13 considered.

14                  Q. But it's the extent of time that the  
15 direct effect is felt. Can we look at page 647 in  
16 Exhibit 722 which is the article you like to refer to,  
17 the Newton article?

18                  A. Yes.

19                  Q. Table 4.

20                  A. Yes, I'm there.

21                  Q. In the far right-hand column?

22                  A. Yes.

23                  Q. For all the treatments, including  
24 2,4,5-T and mixtures of 2,4,5-T and 2,4-D and  
25 triclopyr -- is that how you say that?

1 A. Triclopyr.

2 Q. The condition after treatment in all  
3 those situations was either fully recovered, mostly  
4 recovered or in good health except for one treatment  
5 and that was the treatments with glyphosate; is that  
6 correct?

7 A. That's correct, Mr. Hanna. If I  
8 refer you to the column beside that, which is the  
9 browse index again, the browse index for glyphosate is  
10 basically, in my opinion, similar or comparable to that  
11 of all treatment sites that's in the control and that  
12 in fact --

13 Q. We'll talk about the browse index--

14 A. Okay.

15 Q. --but the question simply was: Does  
16 it not suggest that the impact in this particular case  
17 of glyphosate was much longer than any of the other  
18 treatments?

19 It's the only one that there seems to be  
20 some very clear evidence of negative impact on the  
21 vegetation; is that not correct, or do you not call  
22 yellow foliage deformed a negative impact?

23 MS. CRONK: Mr. Chairman, could my friend  
24 please read out -- put into the record and draw the  
25 Board's attention to the time frame of that column

1 which he failed to do.

2 MR. HANNA: Yes, the time frame is  
3 greater than one year after treatment.

4 MR. KINGSBURY: If I might, I'm not  
5 trying to be the devil's advocate or anything here, Mr.  
6 Hanna.

7 I would suggest to you that one of the  
8 most positive ways you can impact with a herbicide on  
9 moose browse available - and I believe you will find  
10 this within the direct evidence - is to sub-lethally  
11 affect an important plant species that contributes  
12 substantially to moose browse in a fashion in which you  
13 top kill it and cause resprouting from a living root  
14 system.

15 And I would suggest to you that that is  
16 just -- in some instances is -- in some species is more  
17 likely to occur with some chemicals than others.

18 The fact that you see yellow deformed  
19 defoliation here may in fact reflect the fact that you  
20 have not sufficiently killed this plant species with  
21 glyphosate to inhibit resprouting from a root system.

22 MR. HANNA: Q. So you're saying --

23 MR. KINGSBURY: A. I'm not suggesting  
24 that's always the case, but you are concluding from  
25 condition of the deciduous cover one year after

1 treatment something about a long-term effect in terms  
2 of moose browse.

3 Q. Would you agree with me that if  
4 glyphosate impacts are greater than those of 2,4-D that  
5 it may take a number of years for that effect to be  
6 clearly exhibited in wildlife populations, in  
7 particular moose?

8 MS. CRONK: Is that a hypothetical, Mr.  
9 Chairman?

10 MR. HANNA: It is a hypothetical, Mr.  
11 Chairman.

12 MS. CRONK: Thank you.

13 MR. KINGSBURY: If the impacts -- the  
14 negative effects on moose browse--

15 MR. HANNA: Q. Right. I'm --

16 MR. KINGSBURY: A. --are greater, they  
17 may take some time for that to be reflected in the  
18 moose population?

19 Q. Correct.

20 A. Yes, I will agree.

21 THE CHAIRMAN: You are not saying that's  
22 what actually occurs?

23 MR. KINGSBURY: No.

24 MR. HANNA: Q. But that if it did occur  
25 it would take a number of years for that to be



1 exhibited in the population?

2 MR. KINGSBURY: A. In fact, there is  
3 always a lag time of some extent when -- in the time it  
4 takes for a wildlife population to respond to habitat  
5 change, unless it's a dramatic and instantaneous  
6 change, such as a forest fire. I believe that's a  
7 well-established principle.

8 Q. Can we look now at the next paragraph  
9 which deals with the study by Barker and LeLonde?

10 A. Yes.

11 Q. Are you familiar with this study?

12 MS. BLASTORAH: Mr. Chairman, just for  
13 the record, are we back to the ESSA Document now?

14 MR. HANNA: I'm sorry. Thank you, Ms.  
15 Blastorah. Yes, I am talking about page 73 of Exhibit  
16 604C.

17 MR. KINGSBURY: This is an unpublished  
18 report of the Ministry of Natural Resources emanating  
19 from the White River District. I don't believe I have  
20 ever read that study, Mr. Hanna.

21 MR. HANNA: Q. The report was never  
22 published in a peer reviewed scientific journal;  
23 correct?

24 MR. KINGSBURY: A. I couldn't draw that  
25 conclusion. But the reference here is not to a peer

1 reviewed --

2 Q. You don't know that it was -- you  
3 know of it never being published in a peer review?

4 A. I'm not aware that it was, that's  
5 correct.

6 Q. Seeing it was published in 1972 and  
7 glyphosate was not used operationally at that time, it  
8 is quite clear it does not address glyphosate impacts;  
9 correct?

10 A. Absolutely.

11 Q. Can we turn to the Sullivan studies,  
12 please, they appear on the top of page 7 -- well, they  
13 actually start at the bottom of 73, but the main  
14 substance of it is on page 74 at the top.

15 Now, the reference here in terms of --  
16 the first full sentence on the page 74:

17 "There is no significant differences..."

18 Are you familiar that these were  
19 captive--

20 A. Yes.

21 Q. --feeding experiments?

22 A. Yes.

23 THE CHAIRMAN: We went through that  
24 yesterday and the day before.

25 MR. HANNA: Thank you, Mr. Chairman.

1 Q. Would you rely more on the results of  
2 captive experiments of this sort or on actual field  
3 observations of moose behaviour in their natural  
4 habitat to arrive at conclusions on potential  
5 environmental impacts?

6 MR. KINGSBURY: A. Field observations.

7 Q. Would you agree with me that the  
8 Sullivan study does not in any way address the matter  
9 of the long-term impact of glyphosate on habitat after  
10 the death of a browse species?

11 A. Absolutely. I had no intention to  
12 address that.

13 Q. Are black-tailed deer indigenous to  
14 Ontario?

15 A. I don't believe so.

16 Q. Where are they indigenous to?

17 A. The west coast, I believe, of North  
18 America.

19 Q. Where was the Sullivan research  
20 carried out?

21 A. I believe it was carried out on the  
22 west coast.

23 MS. BLASTORAH: Mr. Chairman, it says  
24 right in the last line on page 73 that it was conducted  
25 in British Columbia.

1 MR. HANNA: Q. Mr. Kingsbury, who  
2 sponsored the Sullivans research?

3 MR. KINGSBURY: A. I'm not aware of  
4 that, Mr. Hanna.

5 Q. Perhaps I can help you.

6 THE CHAIRMAN: Does something turn on it,  
7 Mr. Hanna?

8 MR. HANNA: Very much, Mr. Chairman.

9 Q. Could you look on page 137 of Exhibit  
10 6047 (sic), please?

11 THE CHAIRMAN: 604C?

12 MR. HANNA: 604C. Sorry, Mr. Chairman.

13 MR. KINGSBURY: The citation that  
14 indicates that this...

15 MR. HANNA: Q. I'm looking at the second  
16 citation by Sullivan and Sullivan, 1980?

17 MR. KINGSBURY: A. Yes.

18 "Effects of Roundup herbicide on forest  
19 animals in coastal British Columbia..."

20 Q. And it was funded by -- or it was  
21 submitted to who?

22 A. It says here Monsanto Canada Inc.  
23 Final Report and I'm not sure, Mr. Hanna, exactly what  
24 that means. I'm aware that this study is -- I'm quite  
25 certain that this study is --

1 THE CHAIRMAN: Are you suggesting, Mr.  
2 Hanna, that because the study was funded by a company  
3 that somehow the research is suspect or anything like  
4 that?

5 You will appreciate that most of these  
6 studies in connection with toxicology, in terms of the  
7 chemical industry as a whole, is research conducted by  
8 companies because the registration system demands that  
9 the registrants provide the data.

10 MR. HANNA: Absolutely, Mr. Chairman.

11 THE CHAIRMAN: Is that what you are  
12 suggesting?

13 MR. HANNA: Well, I believe Dr. Ritter  
14 has given us the story of -- I forget what the  
15 laboratory is called, but the fraudulent--

16 THE CHAIRMAN: Well, no.

17 MR. HANNA: --lab there. I'm simply --  
18 the point is simply that we don't have similar  
19 protocols.

20 I'm not suggesting there is anything  
21 fraudulent in this, it's simply a matter that we don't  
22 have the same types of protocols that evolved out of  
23 that in undertaking this sort of research.

24 MS. CRONK: Before Mr. Hanna goes any  
25 further, sir, could I interject simply as a caution



1       that this is a public forum and that anything that is  
2       said about a company that even inferentially suggests  
3       any legal impropriety of the conduct of its research is  
4       a very serious matter.

5                   THE CHAIRMAN: I think, in the absence of  
6       any specific evidence you may have in connection with  
7       that supposition, Mr. Hanna, that we move on to  
8       something else.

9                   MR. HANNA: Q. Mr. Kingsbury, are you  
10      aware of any research corroborating the results of the  
11      Sullivans?

12                  MR. KINGSBURY: A. There have been other  
13      studies that basically attempt to address the question  
14      of whether wildlife species will reject  
15      herbicide-treated foliage. Some have been done by the  
16      U.S. Forest Service.

17                  I would suggest that the nature -- first  
18      of all, the intent of such research is simply to look  
19      for a repellant effect. We sometimes know that some  
20      pesticides have repellant effects on some species and  
21      it's probably a reasonable thing to look for.

22                  I'm aware of such studies and I'm aware  
23      of observations such as those made in Sullivan, 1985  
24      saying deer seem to prefer treated foliage than  
25      untreated, that that doesn't at all address the reasons

1       why it was, whether there was an attraction or the  
2       quality of the browse or whatever.

3               I guess to me it's a rather -- if people  
4       think that such studies are done to provide the  
5       impression that somehow the herbicide enhances the  
6       material that's treated as a food source that, one,  
7       that's not the intention of such studies and that no  
8       serious evaluator would consider it to be so.

9               Q.   But there are no strict protocols,  
10      such as the kind that Dr. Ritter told us about, in  
11      terms of bio-medical research for these types of  
12      studies?

13              A.   It's not a specific requirement.

14              Q.   We've heard about the Newton study.  
15      Can we take a moment and go through that, it's Exhibit  
16      722.

17              THE CHAIRMAN:   Is that 723?

18              MR. MURPHY:   722.   Oh, Newton.

19              MR. HANNA:   I believe there are two  
20      Newtons, Mr. Chairman.   There's a 723 and a 722.   It's  
21      the 722 that I would like to...

22              MR. KINGSBURY:   Browse Availability After  
23      Conifer Release In Maine Forests; correct?

24              MR. HANNA:   (nodding affirmatively)

25              Q.   Is this the same study that's

1 referred to on page 74 in the third paragraph of your  
2 report?

3 MR. KINGSBURY: A. Yes, I believe that's  
4 correct.

5 THE CHAIRMAN: We obviously need a file  
6 clerk of some kind up here. I have got it.

7 Thank you.

8 MR. HANNA: Q. Is it your interpretation  
9 of this study that they have concluded that the  
10 herbicide treatments have been beneficial in terms of  
11 browse at least seven years after the treatment?

12 MR. KINGSBURY: A. My interpretation of  
13 the study is that they present data relative to the  
14 browse available on untreated and sites treated with a  
15 variety of herbicides, one year and nine years after  
16 the herbicide treatment takes place, and that data, you  
17 know, presents a factual number, quantifies browse  
18 available at those two time periods.

19 Q. I would just like to ask you a  
20 question - before you get into this too detailed -in  
21 terms of putting yourself as -- say this came on your  
22 desk and you were asked to peer review it.

23 A. Yes.

24 Q. Are there any comments that you would  
25 send back that are systemic type problems with the

1 approach that you would be concerned about?

2 A. From my understanding, and I  
3 certainly didn't read this with, you know, as I would  
4 read a draft manuscript to look at all detail and do  
5 calculations myself, et cetera.

6 I don't have a great deal of difficulty  
7 with the methodology employed specifically in terms of  
8 the main point of this study which is basically  
9 quantifying plant communities within different  
10 treatment blocks at different times.

11 Q. This study did not in any way measure  
12 actual browse utilization by moose; is that correct?

13 A. That's correct.

14 Q. So the measurements of browse, at  
15 least as far as the moose is concerned, are strictly  
16 hypothetical?

17 THE CHAIRMAN: Well, why don't we ask the  
18 moose.

19 MR. KINGSBURY: It's certainly very  
20 commonly -- I mean browse surveys can be done looking  
21 at utilization or they can be looking at browse  
22 available.

23 MR. HANNA: Q. And the way of asking the  
24 moose is to look at browse utilization?

25 MR. KINGSBURY: A. But this study --

1 look at the title: Browse Available After Conifer  
2 Release. That was what the study purports to present,  
3 I believe it presents it with an appropriate  
4 methodology.

5 As to what conclusions someone wishes to  
6 make about browse utilization, I would suggest those  
7 are, you know, beyond what is dealt with in the paper  
8 here. It talks about browse availability.

9 Q. And how would you see going about  
10 taking these availability numbers and putting them to  
11 meaningful terms in terms of likely utilization?

12 A. One would need to know something  
13 about moose populations, moose densities, et cetera.

14 Q. And preference for different types  
15 of--

16 A. Yes.

17 Q. --species are included in this  
18 analysis?

19 A. Yes.

20 Q. As I understand it, the herbicide  
21 applications were applied once deciduous regeneration  
22 was quite advanced; in other words, the vegetation was  
23 over 8 feet tall. Is that correct?

24 A. That's correct.

25 Q. Would you agree that if herbicides



1       were applied to a closed canopy immature deciduous  
2       stand that understorey vegetation would be stimulated  
3       no matter what you applied to the -- what herbicide you  
4       applied?

5                   A.   If herbicide was applied to a closed  
6       conifer canopy...

7                   Q.   No, closed canopy deciduous stand.

8                   A.   If you are assuming that what is  
9       meant by that is that you are removing a mature  
10      overstorey, a well developed older growth deciduous  
11      forest and converting that back to an early growth  
12      stage, I guess that could be the conclusion.

13                   I would not consider that sites that have  
14      been clearcut seven years previously would be anywhere  
15      near that type of a situation, as was the case in this  
16      study.

17                   Q.   So you are suggesting that this stand  
18      had not reached canopy closure at the time that the  
19      herbicide was applied?

20                   A.   Not in the context - it might have  
21      been a very dense shrub community seven years after  
22      treatment, but I wouldn't -- I certainly wouldn't  
23      suggest that it had achieved canopy closure in the  
24      context that it's generally used in a forestry context.

25                   Q.   Would the level of response to

1 herbicide application to deciduous trees and shrubs be  
2 affected by the conifer component in the stand?

3 A. I would suggest in this type of a  
4 stand it wouldn't, simply because the conifers would  
5 certainly not be very well -- very far advanced in  
6 terms of their growth seven years after harvest.

7 Q. Well, that seems to run in the face  
8 of the conclusion that these very authors have made.  
9 If you turn to page 647.

10 A. Yes.

11 Q. The right-hand paragraph there:  
12 "The intensity of thinning obviously  
13 affects both resources."

14 They go on and say:

15 "If you have..."

16 A. I'm there, yes.

17 Q. "...a closer spacing that the impact  
18 would be much less."

19 Is that not the substance of what is  
20 written there?

21 A. I would like to -- just give me a  
22 moment, I can get that into context here.

23 Q. Sorry.

24 MS. CRONK: Sorry. Mr. Hanna, where are  
25 you looking?

1 MR. HANNA: I'm looking in the right-hand  
2 column. It's actually the top two thirds of that  
3 right-hand column.

4 MS. CRONK: Thank you.

5 MR. KINGSBURY: Mr. Hanna, as I read it,  
6 we are talking about spacing here. When it says:

7 "Intensity of precommercial thinning  
8 (i.e. spacing)."

9 MR. HANNA: Q. But is that not the same  
10 as the conifer component? How is that different from  
11 the conifer component?

12 A. But that doesn't -- that  
13 precommercial thinning or spacing of the conifers would  
14 not normally been done with herbicides.

15 Q. My question was: Does the conifer  
16 component affect the response in terms of browse  
17 quality and quantity?

18 A. The original question to which I  
19 believe this discussion refers to dealt with, as I  
20 remember it, the effect of the conifer component on the  
21 herbicide's effects on the hardwoods in the stand. Is  
22 that not correct?

23 Q. Let me read the question. Would the  
24 level of response in terms of browse quality and  
25 quantity be affected by the conifer component in the

1 stand?

2 A. The level of response of what to  
3 what?

4 Q. The level of response in terms of  
5 browse quality and quantity be affected by the conifer  
6 component in the stand?

7 A. I'm sorry.

8 THE CHAIRMAN: There has to be an impact  
9 on the content that you are talking about.

10 MR. HANNA: Q. Could the level of  
11 response as a result of the herbicide applications in  
12 terms of browse quality and quantity be affected by the  
13 conifer component in the stand?

14 MR. KINGSBURY: A. Thank you, Mr. Hanna.  
15 You have, to me, clarified response to the herbicide  
16 application, you have said I have contradicted this  
17 statement here, and I have pointed out to you that this  
18 is talking about a response to a precommercial  
19 thinning a spacing and I have suggested that that is  
20 not the herbicide treatment.

21 Q. I'm sorry, that doesn't sound to me  
22 like it's responding to the question. The question is  
23 and, if you will, it's a hypothetical, it's nothing to  
24 do...

25 THE CHAIRMAN: So it has nothing to do

1 with this column?

2 MR. HANNA: Well, I'm saying -- I asked  
3 him a hypothetical, he said it wouldn't make any  
4 difference because of the nature of the conifers.

5 I went to this column because this column  
6 says, yes, in my view.

7 THE CHAIRMAN: No, he's saying this  
8 column doesn't say yes in his view, he's saying this is  
9 responding to commercial thinning not pesticides.

10 MR. HANNA: "Spacing of 2 by 2 metres  
11 would increase fiber yield, reduce saw  
12 log yield and probably shorten the period  
13 of browse availability."

14 THE CHAIRMAN: But he's talking about  
15 spacing, as I understand what your evidence is, due to  
16 commercial thinning.

17 MR. KINGSBURY: That is what this makes  
18 reference to.

19 MR. HANNA: Q. But a 2 by 2 metre  
20 spacing, does that not have a higher conifer component  
21 than a 3 by 3 metre?

22 MR. KINGSBURY: A. Mr. Hanna, I'm sorry.  
23 Could I please read to you the first sentence on the  
24 right column of this article.

25 "In some areas, therefore, conifer



1 growth and the period of browse  
2 availability would be maximized by early  
3 release with herbicides, that is one  
4 treatment, followed by precommercial  
5 thinnings (i.e. spacings)."

6 That is a separate treatment that is not  
7 related to the herbicide. It doesn't involve the use  
8 of herbicides. That is the way I interpret it.

9 You have just changed the scenario from  
10 your original question saying: How would the presence  
11 of a herbicide -- of the conifers affect the response  
12 of the hardwoods related to a herbicide treatment to  
13 this scenario which involves two separate management  
14 practices; herbicide application followed by spacing.

15 The herbicide application I would take it  
16 to be a release treatment, the spacing followed --  
17 would be following it which would be a precommercial  
18 spacing.

19 Q. Which stand would have the highest  
20 conifer component, that with a spacing of 3 by 3  
21 metres or that with a spacing of 2 by 2 metres?

22 THE CHAIRMAN: I think we are talking  
23 about the same area; aren't we, the same stand?

24 MR. HANNA: Mr. Chairman, I would submit  
25 to the Board what is being said here is that with a 3

1 by 3 metre spacing you have a much fewer number of  
2 stems of conifers in the stand than when you have a 2  
3 by 2 spacing.

4 THE CHAIRMAN: Well, with all respect,  
5 Mr. Hanna, you have totally lost me in this last  
6 scenario, I'm sorry.

7 MS. CRONK: Mr. Chairman, in my  
8 submission, Mr. Hanna has received the answer to the  
9 question not once but at least twice from the witness.

10 It may very well be before this hearing  
11 is complete that one or more of the authors of this  
12 study will be before you. Mr. Hanna can put it  
13 directly to them.

14 THE CHAIRMAN: And, again, Mr. Hanna,  
15 putting a hypothetical in the absence of a factual  
16 situation is not all that helpful, because whatever the  
17 answer is, it's speculative. We don't have a factual  
18 situation that that situation will in fact occur.

19 MR. HANNA: Mr. Chairman, if I could  
20 clarify with Ms. Cronk. If that is an undertaking that  
21 she is going to call these authors, then I certainly  
22 will be quite prepared to hold these questions until  
23 that time.

24 MS. CRONK: When I give an undertaking,  
25 Mr. Hanna, it will be quite clear on the record.

1 I simply indicated that it's possible  
2 that before this hearing is over the authors will be  
3 here for you. In any event, I object. You have  
4 received your answer twice.

5 MR. HANNA: Q. Mr. Kingsbury, what was  
6 the conifer component in the Newton study area?

7 MR. KINGSBURY: A. At what point in the  
8 study, Mr. Hanna?

9 Q. Over the course of the study. What  
10 was the change in conifer component over the course of  
11 the study?

12 A. I don't know at the moment. I'm not  
13 sure that information is even directly contained within  
14 this document, but I would certainly have to look at it  
15 for a while to answer that specific question for you.

16 THE CHAIRMAN: Mr. Hanna, perhaps you  
17 could speed this up by referring Mr. Kingsbury to the  
18 areas where changes in conifer component are noted and  
19 then solicit his opinion as to whether or not he agrees  
20 or whether he has a contrary view.

21 MR. HANNA: I probably could have asked  
22 it that way.

23 Q. My submission to Mr. Kingsbury is, I  
24 have looked through the paper in detail and I can't  
25 find it. And as a result, putting myself in the

1 position of peer reviewer, I had a very hard time  
2 interpreting these results, not having that basic  
3 information presented in the paper.

4 MR. KINGSBURY: A. Are you suggesting  
5 that the absence of data on the conifer component in  
6 this paper -- I'm sorry, I'm not supposed to ask the  
7 questions, right.

8 THE CHAIRMAN: Okay.

9 MR. KINGSBURY: Mr. Hanna, in my opinion,  
10 the absence of data on conifer component in this paper  
11 in no way limits the author's ability to present data  
12 on browse availability.

13 THE CHAIRMAN: Mr. Kingsbury, basically  
14 are you satisfied from your reading of the paper that  
15 the authors used appropriate methodology to be able to  
16 elicit, for whatever value it is, the conclusions they  
17 reached on browse availability?

18 MR. KINGSBURY: Yes, I am.

19 MR. HANNA: Q. And you are also of the  
20 view that the conifer component does not affect the  
21 observations in this paper?

22 MS. CRONK: He said that, sir.

23 THE CHAIRMAN: That is exactly what he  
24 just answered. He's satisfied with the methodology  
25 used, he wasn't able to find changes in conifer numbers

1 in the paper. You are indicating yourself that you  
2 couldn't find it, he hasn't read the paper in that kind  
3 of detail and he has provided the answer.

4 MR. HANNA: And the answer is that it  
5 will not affect...

6 MS. MURPHY: He said that.

7 THE CHAIRMAN: He said it will not affect  
8 the author's ability to comment on browse availability,  
9 as I understood the answer.

10 MR. HANNA: My question is: Is it his  
11 view that if the conifer component was varied that the  
12 results of this study could vary?

13 THE CHAIRMAN: Well, I don't know. He  
14 said he didn't know what the conifer content was.

15 MR. HANNA: Q. I understand, but I'm  
16 asking him now: If the conifer component was changed,  
17 could that affect the results of this study.

18 MR. KINGSBURY: A. Conifer component at  
19 the time of application of the herbicides. You have  
20 got...

21 Q. Time of application and over the  
22 course of the study.

23 A. If I understand your question to be,  
24 if the plant community at the time that the herbicide  
25 was applied was different than the plant community that



1 was -- is documented as being there, would the response  
2 at the site have been different, I would suggest, yes,  
3 it would be.

4 Q. For example, if this was a jack pine  
5 stand, following a forest fire it was pure jack pine  
6 and we treated it with these treatments we might see no  
7 change whatsoever?

8 A. In terms of browse availability?

9 Q. Yes.

10 A. Could be a possibility. Certainly --  
11 if I understand you to be asking my opinion on whether  
12 the changes documented in this study would be expected  
13 to occur all the time these herbicides are applied, I  
14 would say, no, of course not.

15 Q. Well, was this study conducted in  
16 northeastern Maine?

17 A. Yes.

18 Q. Is this the same forest community as  
19 is common throughout the area of the undertaking?

20 A. Not common. It has some resemblance  
21 to some of -- a portion of the area that the  
22 undertaking covers.

23 Q. Is red spruce a common species within  
24 the area of the undertaking?

25 A. It's not a common species within the

1 area of the undertaking, but it fills the same niche as  
2 some of the species.

3 It's a dissimilar forest in some  
4 respects, but it's quite similar in others. For  
5 example, it's ability to sustain spruce, spruce budworm  
6 outbreaks would suggest that it certainly shares some  
7 habitat qualities.

8 Q. Obviously the climate of northeastern  
9 Maine is quite different from that of the area of the  
10 undertaking.

11 MS. CRONK: Obvious to whom, sir, the  
12 witness?

13 MR. HANNA: Yes.

14 MS. CRONK: I don't mean that  
15 facetiously.

16 MR. HANNA: It was a question.

17 MR. KINGSBURY: Mr. Hanna, I would  
18 suggest that there are lots of reasons - and I have  
19 said that - that if this study was carried out on a  
20 different site in northeast Maine, let alone in  
21 Ontario, one could very easily measure different  
22 responses.

23 MR. HANNA: Q. Would you put greater  
24 weight on research results dealing with herbicide  
25 impacts on forest communities in or adjacent to the

1 area of the undertaking or from distant forests growing  
2 under significantly different environmental conditions.

3 MS. CRONK: Is that a hypothetical, sir?  
4 Because it hasn't been established that this witness  
5 view this forest in Maine as being significantly  
6 different, quite the contrary.

7 MR. HANNA: It's a hypothetical, Mr.  
8 Chairman.

9 THE CHAIRMAN: Well, sorry. I think we  
10 can almost take judicial notice of the fact that if  
11 everything were significantly different than what the  
12 situation is in Ontario you might reasonably be  
13 expected to be provided with different results, unless  
14 you want to take a different view of that.

15 MR. KINGSBURY: I would agree, but I  
16 would place the greatest credibility on the studies  
17 that I feel are the best done studies. One that is  
18 perhaps the greatest criteria is the quality of the  
19 research done and the ability to make comparisons from  
20 one site to another.

21 The fact that a study has been done in  
22 Ontario does not suggest to me that it is the most  
23 appropriate study to do, or to rely on in any kind of  
24 an assessment.

25 MR. HANNA: Q. The browse index that is

1 referred here as defined -- I believe you have defined  
2 it, on page 644 in the first paragraph, can you confirm  
3 that the browse index has no measure of the quality of  
4 the browse?

5 MR. KINGSBURY: A. I believe that's  
6 correct.

7 Q. For example, when we were talking  
8 earlier about the yellow deformed vegetation of the  
9 glyphosate treatment, even given that situation, it had  
10 basically the same browse index; is that correct?

11 A. The browse index there does not take  
12 into consideration anything about the quality of it. I  
13 believe that's correct.

14 Q. Is this browse index a widely  
15 recognized measure that has been used in other papers  
16 that you are aware of?

17 A. This specific browse index--

18 Q. This specific browse index?

19 A. --as presented in this paper?

20 Q. Yes.

21 A. Browse index usually is based on  
22 occurrence of species -- selected species that are  
23 considered to be preferred or commonly utilized browse  
24 species for the wildlife species in question.

25 Q. Can you tell me another study that

1       you are familiar with where this browse quality index  
2       has been used?

3                   A.   Exactly as it's utilized here?

4                   Q.   Yes, as devised by those authors.

5                   A.   I would suggest that in some studies  
6       it is limited to a different group of species of browse  
7       plants that might be utilized here.

8                   Q.   For example?

9                   A.   For example, it might say we only  
10      consider...

11                  Q.   No, for example.  An example of where  
12      that has been done?

13                  A.   An example.  I believe that's true of  
14      the study done by Connor here in Thunder Bay that he  
15      has basically said I'm looking at a different specie.

16                  Q.   He has used a browse index; that is  
17      your understanding?

18                  A.   I believe that in his -- in his  
19      quantification of browse available, okay, he hasn't --  
20      he has basically selected species to collect data from.  
21      Okay.  Perhaps --

22                  Q.   But there is a very specific  
23      definition here, Mr. Kingsbury.  It says:

24                         "The ratio of successful browse material  
25                         to that in untreated vegetation."



1                   Are you suggesting that Mr. Connor and  
2                   Gratz have used that in their study?

3                   A. I think Mr. Connor and Gratz have  
4                   quantified it in a different term that isn't a ratio.  
5                   They actually give numerical values to it and then draw  
6                   a ratio between this; i.e., say that this number was  
7                   this, this was that, and therefore there was 12 times.

8                   It's an indication, an attempt to  
9                   quantify relative quantities available, and I believe  
10                  that is widely done. Each and every author doing it  
11                  may do it on the basis of considering these species,  
12                  considering this height range, et cetera.

13                  Q. On page 645 of Exhibit 722 in the  
14                  first full paragraph about the middle, it says:

15                         "For each non-coniferous species per cent  
16                         foliage cover was recorded by ocular  
17                         estimate."

18                  Can you explain to me what your  
19                  interpretation is of ocular estimate?

20                  A. It's basically a judgment call by an  
21                  observer based on estimating, in this case, the  
22                  parameter which would be per cent foliage cover.

23                         It's similar to the way in which often  
24                         data is collected relative to per cent canopy closure.  
25                         One would stand and look up and say what proportion of

1 the sky is seen.

2 Q. Are there quantitative objective ways  
3 of achieving the same end?

4 A. One could go to some trouble to  
5 utilize methods such as taking a photograph and then  
6 using a planimeter to actually map out the area on the  
7 photograph.

8 Q. Relative light intensities, there is  
9 quite a number of ways of doing it?

10 A. There's a number of ways of doing it,  
11 yes.

12 Q. Is ocular estimates the same as  
13 eyeballing?

14 A. It basically -- if you are saying  
15 that that means the observer stands and makes a visual  
16 estimate, yes.

17 THE CHAIRMAN: Is not the very practice  
18 of - using the vernacular - eyeballing used extensively  
19 in things like the Forest Resources Inventory in terms  
20 of photointerpretation of flyovers and things like  
21 that?

22 MR. KINGSBURY: I would agree with that,  
23 that in fact in -- well, as a for instance, in areas  
24 I'm more familiar with of counting organisms, et  
25 cetera, at some point one is reliant on an observation

1 to put a number down on paper.

2 MR. HANNA: Q. So you would agree with  
3 me though that there is a strong qualitative element in  
4 the data collected in this subject -- in this study?

5 MR. KINGSBURY: A. I don't think I would  
6 agree with that because I believe that using  
7 eyeballing, if you want to call it that, to put a  
8 number down on paper is still quantifying.

9 Q. Is either replicable?

10 A. Yes. I would say that within an  
11 accuracy probably of -- and I would suggest to you, Mr.  
12 Hanna, that if one took a photograph and measured the  
13 area in the context in which it is being used here,  
14 measured the area with a planimeter or something, there  
15 would be some inaccuracy in that measurement.

16 If one stands there and looks at it  
17 visually and makes an estimate, there would be some  
18 inaccuracy in the measurement.

19 I suspect in both cases that one would be  
20 dealing with a rather modest inaccuracy in terms of the  
21 numbers that we're dealing with.

22 Certainly it would not account for a  
23 difference of eight times as much vegetative matter in  
24 this plot or on this site versus this site there. It  
25 might account for a difference of 10, 15 per cent, if

1       that, not a factor of 800 per cent.

2                   Q.   Can you explain to me why they used  
3       one observer to record all cover estimates of -- the  
4       subjective component only introduces as a very small  
5       variation in the results?

6                   A.   Because that is one of the best ways  
7       to make sure that if somebody is in fact overestimating  
8       or underestimating by eyeballing, as you've put it,  
9       that they consistently make the same errors in all  
10      plots, all study areas.

11                  Q.   Is there not another way to do it and  
12      to use two or three observers and compare results?

13                  THE CHAIRMAN:   Well, Mr. Hanna, I don't  
14      want to interrupt you, but I think it is, again, a  
15      thing the Board can take judicial notice of.  There are  
16      other methodologies that can be employed in various  
17      studies.

18                  Certainly taking eyeball measurements is  
19      not the only way.  The witness has said that and the  
20      Board appreciates that from its own general knowledge.

21                  So if it is a matter of a series of  
22      questions to say:  Are there not other ways; yes, there  
23      are other ways.

24                  MR. KINGSBURY:   I would just suggest to  
25      you, Mr. Hanna, that if this was an unaccepted

1 methodology this paper would not be published in the  
2 Journal of Wildlife Management, which I think has a  
3 fairly reasonable reputation in terms of a depository  
4 of credible scientific papers.

5 MR. HANNA: Q. Would you not agree that  
6 even in there, though, that there are ranges -- there  
7 is a minimum standard you have to meet to get into that  
8 level and then there's a whole series of ranges beyond  
9 that?

10 MR. KINGSBURY: A. I'll agree.

11 THE CHAIRMAN: Mr. Hanna, I must advise  
12 that Mr. Martel is required to leave here at three  
13 sharp. This isn't one of the days that we can extend  
14 it longer than that.

15 MS. MURPHY: And we do have to discuss  
16 before that three sharp what we're going to do about  
17 bringing these witnesses back, on what date and at what  
18 time.

19 THE CHAIRMAN: Well, let's find out where  
20 Mr. Hanna is.

21 MR. HANNA: I still have at least two  
22 hours, Mr. Chairman.

23 THE CHAIRMAN: Two hours. Okay. Now, we  
24 are going to do the scheduling on the basis that you  
25 won't be more than two hours; is that satisfactory? It



1 makes a difference because we--

2 MR. HANNA: I think --

3 THE CHAIRMAN: --are going to be bringing  
4 witnesses in and starting perhaps on different dates.

5 MR. HANNA: I think, given the fact I'll  
6 have the ability to look at the cross-examination of  
7 other parties at that time and I'll have a chance to  
8 try and perhaps revise my cross-examination given the  
9 evidence that Mr. Kingsbury has given, I can stay  
10 within that two-hour limit.

11 THE CHAIRMAN: Very well. Okay.

12 ---Discussion off the record

13 THE CHAIRMAN: Go through it with the  
14 Board in terms of the estimates that we have got. Two  
15 hours more for Mr. Hanna and then in terms of NAN, the  
16 estimate was I believe a half a day?

17 MS. MURPHY: I think it was up to half a  
18 day, and I think that similar -- I think the thing was  
19 similar also for Treaty 3, about up to half a day, as I  
20 recall.

21 MS. SEABORN: Although, Mr. Chairman, I  
22 have some information that perhaps Treaty No. 3 and NAN  
23 have spoken and between them they would be a half a day  
24 in the sense that --

25 THE CHAIRMAN: I had a conversation with

1 Mr. Colborne last night and actually asked him that  
2 question, and it was his understanding that they would  
3 not be cross-examining on this panel.

4 Now, I don't think he is the one that is  
5 doing the cross-examining for his office.

6 MS. SEABORN: No, I believe his associate  
7 though has spoken with Ms. Kleer and perhaps it would  
8 be on this panel that only NAN will be cross-examining  
9 for the native groups.

10 THE CHAIRMAN: Yes. Mr. Mander just  
11 confirms that Treaty 3 will not be cross-examining and  
12 it is half a day to a day for NAN. So that's where the  
13 other half a day is.

14 MS. SEABORN: Mr. Chairman, perhaps,  
15 because I think I am the only other party, my estimate  
16 had been two to three hours. That is a very  
17 conservative estimate and I expect to be substantially  
18 less than that, perhaps as little as ten minutes.

19 THE CHAIRMAN: Okay. So we can do it in  
20 two days.

21 MS. MURPHY: I think so. The best I can  
22 estimate at this point is that I will probably need a  
23 half a day, but I think we can manage in two days.

24 THE CHAIRMAN: All right.

25 MS. MURPHY: Might I suggest though that

1 on that first day we try to start early.

2 THE CHAIRMAN: Yes.

3 MS. MURPHY: I think we can get the  
4 witnesses in early enough to start early on the  
5 Thursday.

6 THE CHAIRMAN: All right. And we will  
7 sit late on the Thursday as well,

8 MS. MURPHY: Mm-hmm.

9 THE CHAIRMAN: What I am suggesting, Dr.  
10 Ritter and Mr. Kingsbury, is that the two of you come  
11 back for Thursday and Friday.

12 MS. MURPHY: That's the 7th and 8th of  
13 September.

14 THE CHAIRMAN: Right. Since you  
15 indicated you couldn't be here on Wednesday.

16 DR. RITTER: That's correct, Mr.  
17 Chairman. Ms. Murphy actually has just indicated to me  
18 that no expense will be spared in bringing us here  
19 Wednesday evening--

20 THE CHAIRMAN: Okay.

21 DR. RITTER: --to ensure that we can  
22 start early on Thursday. An offer --

23 THE CHAIRMAN: And you realize that there  
24 is no first class service into Thunder Bay.

25 DR. RITTER: Well, not on commercially

1 available flights.

2 THE CHAIRMAN: I stand corrected.

3 MS. MURPHY: If there's a will there's a  
4 way.

5 THE CHAIRMAN: Therefore, if we could  
6 start on the Tuesday with the cross-examination of  
7 Panel 14 --

8 ---Discussion off the record

9 THE CHAIRMAN: The week before we are  
10 going to be doing --

11 MS. MURPHY: 14.

12 THE CHAIRMAN: 14.

13 MS. MURPHY: But I think you were just  
14 suggesting --

15 THE CHAIRMAN: But that was Monday  
16 through Thursday.

17 MS. MURPHY: That's right.

18 THE CHAIRMAN: And then the following  
19 week we would start on the Tuesday and continue with 14  
20 for the two days and then go into this panel for the  
21 remaining two days.

22 MS. BLASTORAH: Mr. Chairman, can I take  
23 it from that that we would be sitting on the Friday to  
24 continue the cross-examination of Panel 14?

25 THE CHAIRMAN: Yes.

1 MS. BLASTORAH: --or that we will just  
2 sit the three days?

3 THE CHAIRMAN: No. The week that Dr.  
4 Ritter is here we would be sitting from the Tuesday  
5 through the Friday.

6 MS. BLASTORAH: So we are coming back to  
7 Friday for 14?

8 THE CHAIRMAN: No, no, that's another  
9 week. That's the week after.

10 MS. BLASTORAH: Oh, I'm sorry. I was  
11 under the impression that perhaps it would only be one  
12 day. Should that be the case...

13 MR. MARTEL: It won't be.

14 THE CHAIRMAN: I think Ms. Murphy has it  
15 in hand, Ms. Blastorah.

16 MS. MURPHY: Speaking of the Friday,  
17 though, is the idea still to try and finish at three on  
18 the Friday, or could we look to asking people to just  
19 extend that date just in case?

20 THE CHAIRMAN: No, what we would do --  
21 no, it really poses an inconvenience for one of the  
22 Board members if they miss a four o'clock plane. We  
23 are talking like hours in an airport if one plane  
24 doesn't connect with another.

25 We will sit late Thursday night and start



1 at the crack of dawn on Friday. We will get in two  
2 full days one way or the other.

3 MS. CRONK: Could I ask, sir, what time  
4 you will be starting on Thursday morning, because I  
5 will not be present two days prior to that.

6 THE CHAIRMAN: Well, you could anticipate  
7 that we might start very early, we might start at, say,  
8 eight o'clock. I would suggest you come in the night  
9 before.

10 MS. CRONK: I got that.

11 THE CHAIRMAN: And then the scoping  
12 session, which is the only other thing, we have already  
13 set for...

14 MS. MURPHY: The previous...

15 THE CHAIRMAN: Monday, the 28th.

16 MS. MURPHY: At 7:00.

17 THE CHAIRMAN: At night, right.

18 DR. RITTER: Mr. Chairman, I have one  
19 housekeeping item that might be a good opportunity to  
20 introduce it.

21 THE CHAIRMAN: Okay. We would like to  
22 sort of get an estimate -- excuse me, Dr. Ritter, just  
23 before we get to you.

24 We would like an estimate on how long the  
25 cross-examination is going to take with respect to 14

1 from whoever is here. I know we did this some time  
2 ago, but we would like a more up-to-date one.

3 MS. BLASTORAH: I'm not sure one how many  
4 of the parties are here that can help us, but...

5 MR. CASSIDY: I think we had agreed, Mr.  
6 Chairman, that we were looking at two weeks to do them  
7 all, based on everybody having provided some  
8 information the last time you canvassed the issue.

9 Myself, I believe that our clients will  
10 take half a day to a day and that would be, like Ms.  
11 Seaborn, conservative. We could be very much less than  
12 that, but I think that was the estimate we gave last  
13 time.

14 THE CHAIRMAN: Mr. Hanna, how long do you  
15 think you will be with 14?

16 MR. HANNA: Mr. Chairman, originally I  
17 indicated three or four days, and I am doing my very  
18 best to contract that. I can't go for three or four  
19 days.

20 So I would hope that it's less than three  
21 days, but if you are budgeting I would suggest...

22 THE CHAIRMAN: All right. Well, that was  
23 the estimate we used last time which brought us up to  
24 two weeks. So I don't think anything has materially  
25 changed unless, Ms. Seaborn, you have a change as well

1 from your previous estimate.

2 MS. SEABORN: No, Mr. Chairman. It  
3 doesn't appear I am going to be reached for some time  
4 with respect to this panel.

5 Has there been any discussion among the  
6 intervenors as to the order when we start on the 28th.  
7 We, of course, don't have any evidence-in-chief and I  
8 was wondering who was leading off.

9 MR. CASSIDY: I --

10 MS. SEABORN: I'm sorry, Mr. Cassidy's  
11 client.

12 THE CHAIRMAN: Well, I would take it it  
13 would be Mr. Cassidy and then it would be followed  
14 by -- Ms. Swenarchuk I think is coming back for Forests  
15 for Tomorrow, and then we would probably get into  
16 either NAN or Treaty No. 3, then possibly Mr. Hanna and  
17 finish up with you, Ms. Seaborn.

18 MR. HANNA: Mr. Chairman, I think Mr.  
19 Edwards got left out of that.

20 THE CHAIRMAN: Oh, I'm sorry.

21 MR. HANNA: I think he has a particular  
22 interest in this panel.

23 THE CHAIRMAN: Right, right.

24 MR. HANNA: I might also suggest that I  
25 can advise the Board at this time that the Federation

1 will not be retaining counsel for the remainder of the  
2 hearing and I suggest, therefore, they should be viewed  
3 as a party without counsel in terms of the Board's  
4 procedural rules.

5 THE CHAIRMAN: We will certainly take  
6 that into account and re-establish the order probably  
7 based on that.

8 MS. SEABORN: Mr. Chairman, I would like  
9 to consider that request and make some submissions when  
10 we return on that because it affects my client. I will  
11 have to take some instructions.

12 THE CHAIRMAN: Very well.

13 MS. BLASTORAH: Mr. Chairman, could I  
14 just run through that again because I think our  
15 recollection at this table was that the original  
16 estimates were upwards of three weeks, three sitting  
17 weeks; that is not three calendar weeks, and I would  
18 just like to go through it again, if I could.

19 THE CHAIRMAN: Okay. As we understand  
20 it, I believe Ms. Swenarchuk --

21 MS. BLASTORAH: I believe she said two  
22 weeks -- or two days was my recollection.

23 THE CHAIRMAN: All right. Two days for  
24 her and three days for Mr. Edwards, I believe; three  
25 days for Mr. Hanna.

1 MS. MURPHY: NAN.

2 THE CHAIRMAN: And NAN I believe was a  
3 half a day to a day.

4 MR. FREIDIN: Nine days so far.

5 MS. MURPHY: And that's not counting MOE.

6 THE CHAIRMAN: And Ms. Seaborn was --  
7 what did you say again?

8 MS. SEABORN: Half a day.

9 THE CHAIRMAN: Half a day.

10 MS. BLASTORAH: And we still have Treaty  
11 3.

12 THE CHAIRMAN: And Treaty 3. And I think  
13 you could count maybe a half a day to a day for them.  
14 That's ten and a half days roughly?

15 MS. BLASTORAH: Ten and a half. I have  
16 roughly ten and a half. So we are into three sitting  
17 weeks.

18 THE CHAIRMAN: And then re-examination.

19 MS. BLASTORAH: It looks like we may have  
20 three sitting weeks allowing for any procedural matters  
21 or...

22 THE CHAIRMAN: Right. Okay, ladies and  
23 gentlemen, we will adjourn --

24 MS. BLASTORHA: Mr. Chairman, there was  
25 one more matter Mr. Ritter wanted to address.



1 THE CHAIRMAN: Oh, sorry.

2 DR. RITTER: One item, again relating to  
3 my homework. I was requested yesterday to produce a  
4 copy of the memorandum of understanding between the  
5 Office of Pesticide Programs of the United States  
6 Environmental Protection Agency and the Health  
7 Protection Branch of the Canada Department of Health  
8 and Welfare, that's now available for distribution.

9 I believe, according to my notes, that  
10 that leaves me with three items to submit; some  
11 references with regards to the role of dietary fiber in  
12 cancer or diet in general in cancer; a full copy of the  
13 Bio-Research study done on behalf of Health and  
14 Welfare, and a glove penetration study when it's  
15 available.

16 The two former items, which are available  
17 now, I will submit before the Board sits again to Ms.  
18 Murphy so that there is time for all to view it if they  
19 like.

20 THE CHAIRMAN: Thank you, Mr. Ritter.  
21 Perhaps we will distribute this and give it an exhibit  
22 number now.

23 MS. CRONK: Much down the line, Dr.  
24 Ritter, you may recall there was an outstanding  
25 undertaking with respect to the farmer mortality study.

1 DR. RITTER: Yes, I will take note of  
2 that and I will make that available as soon as it can  
3 be made available as well.

4 THE CHAIRMAN: Very well.

5 MS. BLASTORAH: Mr. Chairman, I'll just  
6 perhaps identify this for the record. It's --

7 THE CHAIRMAN: We didn't give it an  
8 exhibit number yet; did we?

9 MS. BLASTORAH: No, we haven't. I'm  
10 afraid I don't recall the last exhibit number.

11 THE CHAIRMAN: This will be 772.

12 MS. BLASTORAH: Thank you. And the title  
13 of the document is: Memorandum of Understanding  
14 Between Office of Pesticide Programs, U.S.  
15 Environmental Protection Agency, and Environmental  
16 Health Directorate - perhaps I will just shorten this  
17 up - Health and Welfare Canada.

18 THE CHAIRMAN: Is there a date on that?

19 MS. BLASTORAH: The date of that document  
20 is December 18th, 1979, and I will note that it's  
21 signed by two parties, Edwin L. Johnson, J-o-h-n-s-o-n,  
22 Deputy Assistant Administrator for Pesticide Programs,  
23 U.S. Environmental Protection Agency, and an A.B.  
24 Morrison, M-o-r-r-i-s-o-n, Assistant Deputy Minister  
25 Health Protection Branch.

1 Thank you, Mr. Chairman.

2 THE CHAIRMAN: Thank you.

3 ---EXHIBIT NO. 772: Document entitled: Memorandum of  
4 Understanding Between Office of  
5 Pesticide Programs, U.S.  
6 Environmental Protection Agency,  
and Environmental Health  
Directorate, Health and Welfare  
Canada, dated December 18, 1979.

7 THE CHAIRMAN: All right. We will  
8 adjourn now until August the 28th at 1:00 p.m.

9 Ladies and gentlemen, just before you  
10 leave, I would ask that the parties who have not yet  
11 gotten in their statement of issues for Panel 15 do so.  
12 They were due a few days ago and we would not like to  
13 see them come in later than Monday, which will give you  
14 the weekend to work on them, if you haven't got them  
15 in.

16 Thank you.

17

18 ---Whereupon the hearing adjourned at 3:07 p.m., to be  
19 reconvened on Monday, August 28th, 1989, commencing  
at 1:00 p.m.

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